NASA
Payload Regulations

Flight Projects Directorate

Basic

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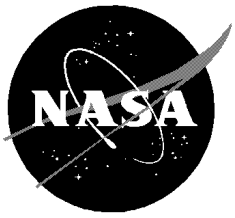

National Aeronautics and
Space Administration

**George C. Marshall Space
Flight Center**

NASA Marshall Space Flight Center

PAYLOAD REGULATIONS

REVISION AND HISTORY PAGE

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NASA Marshall Space Flight Center

PAYLOAD REGULATIONS

NASA PAYLOAD REGULATIONS

LIST OF CHANGES

DECEMBER 14, 2000

All changes to paragraphs, tables, and figures in this document are shown below:

CCBD #	ENTRY DATE	CHANGE	PARAGRAPH(S)
PB3-02-0058	12-14-00	Baseline	All

PAYLOAD REGULATIONS

TABLE OF CONTENTS

PAYLOAD REGULATIONS

COMMAND & DATA HANDLING (C&DH)

COMMUNICATIONS & TRACKING

RESOURCE MANAGEMENT

PAYLOAD SUPPORT SYSTEMS (PLSS)

PAYLOAD REGULATIONS

PAYLOAD REGULATIONS

PAYLOAD REGULATIONS

PAYLOAD REGULATIONS

SECTION N1 - INTRODUCTION

N1.1-1 PAYLOAD REGULATIONS PURPOSE

THE PURPOSE OF THIS DOCUMENT IS TO DEFINE REGULATIONS FOR OPERATING NASA PAYLOADS ON THE INTERNATIONAL SPACE STATION (ISS) AND OPERATING INTERNATIONAL PARTNER (IP) PAYLOADS IN THE NASA ELEMENTS. NASA PAYLOADS INCLUDE U.S. PAYLOADS, AGENZIA SPAZIALE ITALIANA (ASI) PAYLOADS, AND BRAZILIAN PAYLOADS. THE REGULATIONS STATE THAT DECISIONS ARE AGREED TO IN ADVANCE AND ARE DESIGNED TO REDUCE THE AMOUNT OF REALTIME DISCUSSION AND DECISION MAKING.

N1.1-2 PAYLOAD REGULATIONS SCOPE

THESE REGULATIONS ENCOMPASS NASA PAYLOAD OPERATIONS. NASA PAYLOADS AND OTHER PAYLOADS LOCATED IN NASA ELEMENTS MUST ABIDE BY THESE REGULATIONS. REGULATIONS FOR WHICH EXCEPTIONS ARE DEFINED MUST BE PROCESSED AND APPROVED BY THE NASA PAYLOAD OPERATIONS CONTROL BOARD (NPOCB) AS A DEVIATION TO THE PAYLOAD REGULATIONS. APPROVAL MUST OCCUR PRIOR TO INCORPORATION INTO THE DOCUMENT.

N1.1-3 REALTIME OPERATING POLICY

NORMAL PAYLOAD OPERATIONS WILL BE CONDUCTED ACCORDING TO THESE PAYLOAD REGULATIONS, THE MULTILATERAL PAYLOAD REGULATIONS, AND WITHIN THE ISS OPERATIONAL FLIGHT RULES. WHERE THE NASA PAYLOAD REGULATIONS AND THE MULTILATERAL PAYLOAD REGULATIONS OR THE ISS OPERATIONAL FLIGHT RULES ARE IN CONFLICT, THE ORDER OF PRECEDENCE WILL BE AS FOLLOWS:

A. ISS FLIGHT RULES

B. MULTILATERAL PAYLOAD REGULATIONS

C. NASA PAYLOAD REGULATIONS

N1.1-4 REGULATIONS FORMAT

A. PAYLOAD REGULATIONS TEXT IS IN UPPER CASE.

Rationale text is italicized sentence case.
APPLICABILITY, EFFECTS, AND DOCUMENTATION HEADINGS ARE IN UPPER CASE.
Following text is sentence case.

PAYLOAD REGULATIONS

B. RATIONALE STATEMENTS ARE NOT PART OF THE REGULATION STATEMENT AND ARE NOT BINDING. THEY ARE EXPLANATION COMMENTARY ONLY.

C. REGULATION PARAGRAPHS ARE PRECEDED WITH THE LETTER “N” (N4.1-2) TO IDENTIFY THEM AS NASA REGULATIONS AND TO DISTINGUISH THEM FROM MULTILATERAL REGULATIONS (M4.1-2).

PAYLOAD REGULATIONS

SECTION N2 - AUTHORITY AND RESPONSIBILITY

N2.1-1 PAYLOAD OPERATIONS DIRECTOR (POD) AUTHORITY

THE POD IS IN CHARGE OF THE EXECUTION OF REALTIME PAYLOAD OPERATIONS INTEGRATION CENTER (POIC) PAYLOAD OPERATIONS. THE POD HAS OVERALL AUTHORITY FOR EXECUTE LEVEL NASA PAYLOAD PLANNING AND OVERSIGHT OF REALTIME PAYLOAD OPERATIONS WITHIN NASA ELEMENTS.

Rationale: The NASA payloads and payloads located in NASA elements must have a clear understanding at all times of who is directing the realtime payload operations.

FLIGHT/INCREMENT APPLICABILITY: Generic

N2.1-2 POIC AUTHORITY AND RESPONSIBILITY FOR NASA SEGMENT PLANNING

THE POIC IS RESPONSIBLE FOR THE INTEGRATION AND OPERATIONS OF ALL NASA (U.S.), ASI (ITALIAN), AND INPE (BRAZILIAN) PAYLOADS, NASA LABORATORY SUPPORT EQUIPMENT (LSE), AND NASA PAYLOAD SUPPORT SYSTEMS (PLSS) INCLUDING PAYLOAD SAFETY, PAYLOAD OPERATIONS PLANNING, PAYLOAD OPERATIONS RESOURCE MANAGEMENT, AND PAYLOAD ANOMALY RESOLUTION. IN THIS CAPACITY, THE POIC WILL:

A. ENSURE RESOURCE AVAILABILITY AND PROTECT PAYLOAD OPERATIONS FROM INTERFERENCE WITH OTHER PARTNER PAYLOADS OR ISS SYSTEM OPERATIONS.

B. COORDINATE SPACE-TO-GROUND (S/G) COMMUNICATIONS AMONG POIC CONTROLLED PAYLOADS AND THE CREW TO MINIMIZE CREW INTERRUPTIONS.

C. REPORT ANY PAYLOAD ACTIVITIES WHICH MAY AFFECT SAFETY OR MULTI-ELEMENT PAYLOAD OPERATIONS.

D. COORDINATE ANY PAYLOAD OPERATIONS CHANGES TO THE SHORT-TERM PLAN (STP).

FLIGHT/INCREMENT APPLICABILITY: Generic

N2.1-3 AUTHORITY DELEGATED TO THE LEAD INCREMENT SCIENTIST (LIS) REP

DURING PERIODS WHEN A PD TEAM HAS NO PERSONNEL ON CONSOLE, THE LIS REP WILL REPRESENT THAT TEAM AND RECEIVE CALLS DIRECTED TO THEM.

A. THE LIS REP WILL COORDINATE SCIENCE OPERATIONAL DECISIONS OCCURING IN AN OFF-CONSOLE PERIOD WITH THE AFFECTED PI/PD TEAM, RPO INCREMENT SCIENTIST, AND THE LIS.

B. THE LIS REP IS DELEGATED THE AUTHORITY TO MAKE SCIENCE OPERATIONAL DECISIONS WHEN ALL OF THE FOLLOWING CONDITIONS ARE MET:

1. A SCIENCE OPERATIONAL DECISION REQUIRES IMMEDIATE RESPONSE OR ACTION,
2. PI/PD TEAM OR RPO INCREMENT SCIENTIST HAS NO PERSONNEL ON CONSOLE, ARE NOT AVAILABLE, AND CANNOT BE CONTACTED,
3. LIS IS NOT AVAILABLE OR CANNOT BE CONTACTED.

NOTE: OPERATIONAL DECISIONS WILL BE BASED ON RECENT PAYLOAD EVENTS, PAYLOAD PROGRESS REPORTS, DAILY SCIENCE ACCOMPLISHED VS. REQUIRED SCIENCE RETURN, SUPPORTING SCIENCE DOCUMENTATION, DOCUMENTED OFF-NOMINAL PLANS/PROCEDURES, LIS PRIORITIES AND POIC CADRE, ISS SAFETY AND/OR FLIGHT SURGEON RECOMMENDATIONS.

C. WHEN A REQUEST FOR SCIENCE INFORMATION IS ONE THAT IS DOCUMENTED BY THE PI/PD TEAM AND THE LIS REP CAN READILY PROVIDE THAT INFORMATION, THEY WILL DO SO. OTHERWISE, THE LIS REP WILL REFER THE REQUESTING POSITION TO THE APPROPRIATE PAYLOAD POINT OF CONTACT.

D. ~~D.~~ THE LIS REP WILL LOG ANY INFORMATION ON ISS EVENTS THAT AFFECTS THE OFF-CONSOLE PD TEAM. THIS INFORMATION WILL BE RELAYED TO THE PD TEAM IMMEDIATELY OR WHEN THE TEAM RETURNS TO CONSOLE, DEPENDING ON THE NATURE AND URGENCY OF THE SITUATION.

E. THE LIS REP WILL PROVIDE THE DAILY SCIENCE STATUS FOR ANY PD TEAM THAT IS OFF-CONSOLE.

F~~E~~. THE PD MAY NAME AN ALTERNATE AUTHORITY TO REPRESENT THEM WHILE OFF-CONSOLE. AUTHORITY WILL DEFAULT TO THE LIS REP IF THE ALTERNATE CANNOT BE REACHED.

GF. IN THE EVENT THAT THE LIS REP IS UNABLE TO PROVIDE AN OPERATIONAL DECISION WITHIN AN ALLOCATED TIMEFRAME, THE POIC WILL SAFE THE AFFECTED PAYLOAD UNTIL THE NECESSARY GUIDANCE IS PROVIDED.

Rationale: Many PD team will not support console operations on a 24 x 7 basis. However, on-going operations may require information/decisions from a non-supporting team or events could transpire which affect the team's payload operations. The LIS Rep is the proper 24 x 7 cadre position for coordinating off-console PD teams actions. It is in the best interest of the PD teams to identify as many off-nominal situations as possible that could affect their payload and to develop the desired responses for them – over and above the specific cases required in N14.1-5. Such plans should be documented in section 12(Payload Unique Regulations) of this document and the Payload Operations Handbook (POH).

FLIGHT/INCREMENT APPLICABILITY: Generic

N2.1-4 SUSPENSION OF CERTIFICATION

A. THE POD HAS AUTHORITY TO SUSPEND CERTIFICATION OF A POIC FLIGHT CONTROLLER WHOSE PERFORMANCE DOES NOT IN HIS/HER JUDGEMENT MEET STANDARDS FOR POIC CADRE.

B. THE INCREMENT LEAD POD WILL APPROVE REMEDIATION PLANS AIMED AT RESTORING A FLIGHT CONTROLLER TO CERTIFIED STATUS.

C. UPON SUCCESSFUL COMPLETION OF PLANNED REMEDIATION, THE ORIGINAL CERTIFYING AUTHORITY SHALL RECERTIFY THE SUSPENDED FLIGHT CONTROLLER.

Rationale: A single significant performance error or compounding of less significant errors will point to deficiencies in an individual's preparation for console duties. Upon detecting this situation, the POD is obligated by safety of flight and mission success considerations to revoke the person's flight-certified status and call for a replacement until remedial steps are taken. The Increment Lead POD will approve remedial plans designed to resolve the deficiencies at issue. When the individual has successfully completed the requirements of the remedial plans, the original certifying authority shall review the results of those actions and determine suitability for recertification.

DOCUMENTATION: SPIP, Volume 7, Section 5

FLIGHT/INCREMENT APPLICABILITY: Generic

N2.1-5 GENERAL RESPONSIBILITIES OF THE POIC CADRE

A. ALL CADRE MEMBERS SHALL MONITOR THE S/G VOICE LOOP, THE POD LOOP AND THEIR OWN LOOP AT ALL TIMES. WHEN A CREW CALL IS RCEIVED, ALL ATTENTION SHOULD TURN TO S/G. THE ANSWER TO ANY CREW QUERY SHOULD BE GIVEN ON THE POD LOOP. IF DETAILED/LENGHTY DISCUSSIONS ARE REQUIRED IN ORDER TO DETERMINE THE RESPONSE, THESE CONVERSATIONS SHOULD OCCUR ON THE OC LOOP. THE POD WILL GIVE THE FINAL APPROVAL FOR ALL VOICE UPLINKS TO THE CREW.

B. THE POD LOOP IS AN EXTERNAL, HIGH VISIBILITY LOOP. ALL DISCUSSIONS REMAIN SHORT AND TO THE POINT. IT IS NOT A LOOP FOR WORKING IN-DEPTH PROBLEMS.

C. EACH DISCIPLINE WITHIN THE CADRE HAS AN APPROPRIATE CHAIN OF COMMAND WITHIN THAT TEAM. THE CPO, PRO, AND PAYCOM SHALL REPORT DIRECTLY TO THE OC. THE PHANTOM SHALL REPORT TO THE DMC. THE LIS REP, SCM, DMC, OC, AND TCO SHALL REPORT TO THE POD. THE POD SHALL REPORT TO THE MCC-H FLIGHT DIRECTOR AND HAS THE RESPONSIBILITY OF KEEPING HIM/HER INFORMED OF ALL ASPECTS OF PAYLOAD OPERATIONS. EACH CADRE MEMBER SHALL MONITOR THE FLIGHT DIRECTOR LOOP AND BE PREPARED TO ASSIST THE POD IN ANSWERING ANY QUESTIONS THAT PERTAIN TO THEIR DISCIPLINE. RESPONSES SHOULD BE GIVEN TO THE POD ON THE POD LOOP. THE FOLLOWING ARE THE GENERAL EXPECTATIONS FOR EACH OF THE DISCIPLINES:

OC:	SHALL MAINTAIN COGNIZANCE OF ALL COMMANDING AND COMMUNICATIONS WITH THE CREW.
DMC:	SHALL MAINTAIN COGNIZANCE OF ALL DATA AND VIDEO BOTH ON-BOARD AND ON THE GROUND.
TCO:	SHALL MAINTAIN REAL-TIME COGNIZANCE OF SCHEDULED ACTIVITY RESOURCE REQUIREMENTS.
SCM:	SHALL MANTAIN COGNIZANCE OF ALL PAYLOAD SAFETY ISSUES.
LIS REP:	SHALL MAINTAIN REAL-TIME COGNIZANCE OF SCIENCE PRIORITIES AND DAY TO DAY CHANGES IN THOSE PRIORITIES.

D. THE FOLLOWING STEPS SHOULD BE ADHERED TO IN THE PROCESS OF PROBLEM RESOLUTION AND ACTION DETERMINATION:

PAYLOAD REGULATIONS

1) ONCE A PROBLEM HAS BEEN IDENTIFIED, IT SHOULD BE REPORTED TO THE POD IMMEDIATELY.
2) AS NEW INFORMATION IS DISCOVERED, STATUS THE POD.
3) REPORT ANY RECOMMENDATIONS FOR PROBLEM RESOLUTION TO THE POD.

IN THE PROCESS OF RESOLVING A PROBLEM, THERE ARE SEVERAL THINGS THAT ARE IMPORTANT TO REMEMBER.

1) THE SCM AND OC NEED TO COORDINATE ALL SAFETY ISSUES.
2) LIS REP WILL ADDRESS ANY SCIENCE PRIORITY CONCERNS AND REPORT RESOLUTIONS TO THE OC.
3) THE OC ADDRESSES OPERATIONS CONSTRAINTS.
4) ALL CADRE MEMBERS SHALL COORDINATE AND EXCHANGE INFORMATION WITH THEIR MCC-H COUNTERPARTS.
5) ALL COMMITMENTS AND ACTIONS MUST BE APPROVED BY THE POD. THE POD WILL THEN SEEK CONCURRENCE FROM THE MCC-H FLIGHT DIRECTOR.

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

SECTION N3 - PAYLOAD OPERATIONS

N3.1-1 INVESTIGATION TROUBLESHOOTING/FAILURE

A. IF A PAYLOAD EXPERIENCES AN ANOMALY, THE POIC WILL ENSURE THAT THE PAYLOAD ANOMALY DOES NOT INTERFERE WITH THE OTHER PAYLOAD ACTIVITIES DEFINED IN THE ON-BOARD SHORT-TERM PLAN (OSTP).

B. ANOMALY RESOLUTION EFFORTS THAT REQUIRE MODIFIED OR ADDITIONAL RESOURCES WILL REQUIRE AN OPERATIONAL CHANGE REQUEST (OCR) SUBMITTED BY THE USER TO THE POIC.

C. IF A PAYLOAD FAILS COMPLETELY, THE POIC MAY USE THE ADDITIONAL RESOURCES FOR OTHER NASA PAYLOAD OPERATIONS.

D. PAYLOADS WITHOUT MALFUNCTION PROCEDURES WILL BE SAFED IN THE EVENT OF AN ANOMALY.

Rationale: The POIC will work to resolve the anomaly or may perform other payload operations within existing resources. Any deviation from the planned resource distribution must be coordinated and approved by the POD.

FLIGHT/INCREMENT APPLICABILITY: Generic

DOCUMENTATION: Flight Rule B1.2.1-18

N3.1-2 PAYLOAD PRIORITIES

THE LEAD INCREMENT SCIENTIST REPRESENTATIVE(LIS REP) WILL PROVIDE SCIENCE PRIORITIES AS NEEDED DURING REALTIME OPERATIONS~~NG~~. THE POD WILL HAVE THE FINAL AUTHORITY REGARDING ANY CHANGES TO PLANNED OPERATIONS SUGGESTED BY CHANGING PRIORITIES.

Rationale: The LIS REP is the point of coordination on console that the POIC cadre will look to for decisions regarding science priorities.

FLIGHT/INCREMENT APPLICABILITY: 5A.1 and subs

PAYLOAD REGULATIONS

N3.1-3 PAYLOAD PRIORITIES DURING REPLANNING

USE OF RESOURCES SUDDENLY MADE AVAILABLE TO PAYLOAD OPERATIONS AND/OR ACTIVITIES THAT MUST BE REPLANNED ARE TO BE PRIORITIZED ACCORDING TO THE FOLLOWING CRITERIA (IN THIS ORDER). HOWEVER, THE LIS REP MAY INPUT SCIENCE PRIORITIES THAT MAY AFFECT THE PRIORITIES LISTED ABOVE AND THE POD WILL MAKE THE FINAL DECISION.

A. CURRENT SCIENCE PRIORITIES

B. ACTIVITIES LOST DUE TO ISS OR U.S. LAB PROBLEMS OR DUE TO MALFUNCTION/IN-FLIGHT MAINTENANCE PROCEDURES (MALS/IFMS) PERFORMED FOR OTHER EXPERIMENTS.

C. ACTIVITIES LOST DUE TO PAYLOAD FACILITY MALFUNCTIONS.

D. ACTIVITIES LOST DUE TO INTERNAL EXPERIMENT (WITHIN A PAYLOAD) MALFUNCTIONS.

E. TASKS THAT MUST BE COMPLETED TO AVOID IMPACTS TO LOGISTICS AND PAYLOAD MANIFESTS ON FUTURE FLIGHTS/INCREMENTS.

F. SCIENCE OF OPPORTUNITY.

G. ALL OTHER TASKS.

Rationale: The above priorities were established based on payload programmatic priorities of first achieving successful completion of the current increment and then minimizing impact to future increments.

Decisions regarding the use of freed-up resources or for any type of replanning should follow this prescribed set of priorities. The POD will make the final decision guided by these with input from the LIS REP, the user community, and the cadre factoring in the ability of on-board and ground systems and personnel to implement the decision.

FLIGHT/INCREMENT APPLICABILITY: 5A.1 and subs

PAYLOAD REGULATIONS

N3.1-4 PAYLOAD POWER INTERRUPTION CONSTRAINTS

THE FOLLOWING MATRIX GIVES THE IMPACT ~~AND ASSOCIATED ACTIONS REQUIRED IN THE EVENT~~ OF A LOSS OF POWER FOR SPECIFIC PAYLOADS. THESE POWER REQUIREMENTS INCLUDE TRANSFER FROM SHUTTLE TO ISS, OPERATIONS ON ISS AND TRANSFER BACK TO THE SHUTTLE.

~~PAYLOAD~~	~~LOSS OF POWER IMPACT~~
~~CPCG~~	~~CPCG will lose sample viability within 30 minutes due to loss of temperature control.~~
~~CGBA~~	~~CGBA will lose sample viability within 30 minutes due to loss of temperature control.~~
~~ADVASC~~	~~ADVASC can withstand up to 1 hour without power during ADVASC operations, with powered-down events separated by at least 36 hours. If the plant photo cycle is upset, chamber conditions quickly diverge from the desired set points.~~
~~PCG-STES~~	~~The PCG-STES growth chambers cannot be unpowered for more than 30 minutes to maintain a temperature controlled environment.~~

PAYLOAD	LOSS OF POWER IMPACT
APCF	APCF will lose sample viability within 30 minutes due to loss of temperature control. Temperature excursions will be detrimental to science.
BTR	BTR will lose sample viability within 30 minutes due to loss of temperature control. Temperature excursions will be detrimental to science.
DCPCG-V	The V-Locker will lose sample viability within 30 minutes due to loss of temperature control. Temperature excursions will be detrimental to science.

Rationale: This matrix defines the impacts and associated actions required in the event of a loss of power.

FLIGHT/INCREMENT APPLICABILITY: Inc 3~~2~~. This matrix should be readdressed for each increment.

N3.1-5 REALTIME PLANNING INPUTS

PAYLOAD REGULATIONS

LATE INPUTS TO SHORT-TERM PLANNING AND REALTIME PLANNING PROCESSES WILL BE CONSIDERED IN A SUBSEQUENT PLANNING CYCLE.

Rationale: The planning cycles are time critical. As such, late inputs cannot be accommodated due to the required integrated planning product delivery deadlines.

FLIGHT/INCREMENT APPLICABILITY: Generic

N3.1-6 MONITORING REALTIME COMMUNICATIONS

CADRE MEMBERS AND PAYLOADS TEAMS SHALL MONITOR PAYLOAD ACTIVITIES DURING COMMUNICATIONS WITH THE VEHICLE(S). LOOPS TO BE MONITORED ARE AIR TO GROUND (A/G), S/G, AND POD. ALL LOOP TRAFFIC SHOULD STOP DURING CREW VOICE TRAFFIC EXCEPT THAT VOICE TRAFFIC THAT IS NECESSARY TO ANSWER CREW QUESTIONS.

Rationale: Cadre members and PDs need to monitor realtime activities during their payload operations involving the crew. The crew may call with questions or comments, so the ground must be prepared in the event they are called upon for information. Monitoring will ensure timely responses to on-board situations. Crew voice traffic is expected to be limited. All realtime activity changes are briefed/approved on the POD loop; therefore, monitoring the POD loop ensures everyone remains cognizant of current situations/plans. Exceptions to this philosophy are the Short-Term Planning team and on-call personnel. PDs that do not man their console 24x7 may delegate this responsibility to the LIS Rep.

FLIGHT/INCREMENT APPLICABILITY: Generic

N3.1-7 REALTIME PAYLOAD OPERATIONS SUPPORT

A. PD TEAMS ARE REQUIRED TO SUPPORT THEIR PAYLOADS' ACTIVITIES DURING THE FOLLOWING TYPES OF ACTIVITIES:

    1. CREW-TENDED OPERATIONS

    2. HAZARDOUS OPERATIONS

    3. CRITICAL OPERATIONS

    4. GROUND OR AUTOMATED COMMANDING

B. DURING UNATTENDED, QUIESCENT OR STAND-BY ACTIVITIES, THE PD TEAMS MAY RELINQUISH THEIR MONITORING RESPONSIBILITIES TO THE LIS REP.

Rationale: The PD teams should support all activities that are critical from a science and/or mission success standpoint because the crew may call down with questions/observations, payload resources may be changed and malfunctions may occur. During instances when the PD team is off console, the LIS Rep will assume the responsibilities outlined in payload regulation N2.1-3.

FLIGHT/INCREMENT APPLICABILITY: Generic

N3.1-8 DAILY PAYLOAD OPERATIONS DURING OFF-DUTY TIME

THE FOLLOWING CRITICAL PAYLOAD ACTIVITIES WILL BE INCLUDED IN THE DAILY PAYLOADS OPERATIONS (DPO) TO BE PERFORMED EACH DAY DURING THE CREW OFF-DUTY TIME: ~~COMMERCIAL PROTEIN CRYSTAL GROWTH (CPCG)~~APCF AND DCPCG STATUS CHECKS, BSTC ROUTINE MAINTENANCE (DURING THE 14 DAYS OF ITS RUN), BTR ROUTINE MAINTENANCE ~~ADVANCED ASTROCULTURE (ADVASC) STATUS MONITOR (DESIRED), COMMERCIAL GENERIC BIOPROCESSING APPARATUS (CGBA) MAINTENANCE,~~ AND BONNER BALL CLOCK CHECK. THESE ACTIVITIES REQUIRE A ~~10~~30-MINUTE BLOCK OF TIME FOR ONE CREWMEMBER ~~PRIOR TO 6A AND A 25-MINUTE BLOCK OF TIME FOR ONE CREWMEMBER AFTER 6A.~~DURING THE 7A.1 STAGE.

Rationale: Certain payloads require daily activities to ensure that the payload is operating nominally to avoid risk to payload hardware or science.

FLIGHT/INCREMENT APPLICABILITY: Increment 3~~2~~

N3.1-9 IMPACT TO PAYLOADS DUE TO LOSS OF HEALTH AND STATUS INFORMATION

CONSIDERATION WILL BE GIVEN TO ALLOW A PAYLOAD TO REMAIN POWERED ON IN THE EVENT THAT DOWNLINK OF THE PAYLOAD'S HEALTH AND STATUS DATA STREAM IS NO LONGER AVAILABLE. THE FOLLOWING CONDITIONS MUST BE SATISFIED IN ORDER FOR THE PAYLOAD TO REMAIN POWERED:

A. THE PAYLOAD WAS OPERATING NOMINALLY PRIOR TO THE LOSS OF ITS HEALTH AND STATUS DOWNLINK.

B. THE RACK SUPPORT SYSTEMS WERE OPERATING NOMINALLY PRIOR TO THE LOSS OF THEIR HEALTH AND STATUS DOWNLINK.

~~IN THE EVENT THAT THE PAYLOAD'S HEALTH AND STATUS DATA IS NOT REGAINED WITHIN ONE ORBIT AFTER POIC TROUBLESHOOTING, THE PAYLOAD WILL BE POWERED OFF.~~THE AMOUNT OF TIME THAT WILL BE ALLOWED FOR TROUBLESHOOTING IS SITUATION-DEPENDENT AND WILL BE NEGOTIATED BETWEEN THE POD AND THE FLIGHT DIRECTOR.

Rationale: The health and status data stream contains the Emergency, Caution, and Warning word. Powering down the payload immediately after the data loss could impose significant science loss for certain payloads. Allowing the POIC to troubleshoot the data loss anomaly while the payload remains powered could significantly minimize any potential science loss.

DOCUMENTATION: 7A.1 Flight Rules

FLIGHT/INCREMENT APPLICABILITY: Generic

N3.1-10 PAYLOAD SAFING METHOD PRIORITY

WHEN A SITUATION REQUIRES PAYLOAD SAFING, CONSIDERATION WILL BE GIVEN TO PRESERVING RESEARCH CAPABILITY. METHODS TO PERFORM PAYLOAD SAFING ARE (IN ORDER OF PREFERENCE):

A. GROUND-COMMANDED PROCEDURE PERFORMED BY PD

B. GROUND-COMMANDED PROCEDURE PERFORMED BY POIC

C. CREW MANUAL PROCEDURE

D. GROUND-COMMANDED PAYLOAD RACK POWERDOWN BY MISSION CONTROL CENTER-HOUSTON (MCC-H)

Rationale: The ability to save science while safing the payloads is a function of how much time is available and the nature of the situation that precipitated the safing. Science prioritization by the LIS Rep would also affect method selection. The POD will make the final decision.

Method A is most preferred because of insight that the PD has into the final payload condition and likelihood that research operation may be restored at a future time. However, situation urgency, command link availability, and reliability may preclude this option.

Method B is next preferred to preserve the ability to return to research operations at a future time and may prove most expedient in an urgent situation demanding integrated safing of multiple payloads.

Method C is less preferred because the crew may be required to respond to urgent systems or vehicle conditions. However, this approach would achieve an understood condition if ground commanding were not available or reliable.

Method D is least preferred because although payloads are expected to sustain abrupt loss of power without hazardous effects, the ability to resume future research operations may be harmed. However, a seriously threatening situation may require this response (e.g., fire).

DOCUMENTATION: ISS Generic Operational Flight Rules, Volume B: B1.2.1-2 and B1.2.1-17.

FLIGHT/INCREMENT APPLICABILITY: Generic

N3.1-11 PAYLOAD START-UP NOTIFICATION

A PAYLOAD, RACK, OR FACILITY MUST ALREADY BE POWERED ON BEFORE THE START-UP NOTIFICATION WILL BE SENT.

Rationale: In order to prevent excessive error messages, the start-up notification command on the PL MDM must be sent after a payload, rack, or facility has been powered up and is ready to send data. Coordination with the CPO will minimize the time between the power-up command and the downlink of data. If too many error messages are received at the PL MDM, the wrap-around error buffer may dump an unexpected error message.

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

SECTION N4 - AUTOMATED PROCEDURES

N4.1-1 GENERAL

AUTOMATED PROCEDURES AND PROCEDURE UPDATES SHALL CONFORM TO OPERATIONS DATA FILE (ODF) PROCEDURES STANDARDS, SSP 50253, AND TIMELINER BUNDLE FORMAT THAT ARE IN PLACE AT THE TIME OF THE FREEZE POINT APPROVED BY THE PAYLOAD CONTROL BOARD (PCB).

FLIGHT/INCREMENT APPLICABILITY: Generic

N4.1-2 PROCEDURE CERTIFICATION

ALL PROCEDURES AND PROCEDURES UPDATES SHALL BE CERTIFIED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:

A. PROCEDURES SHALL BE WRITTEN IN STANDARD ASCII FORMAT.

B. PROCEDURES SHALL CONFORM TO THE USER INTERFACE LANGUAGE (UIL) STANDARDS DOCUMENT FOR THE DEVELOPMENT OF TIMELINER AUTOMATED PROCEDURES.

C. PROCEDURES SHALL BE COMPILED WITH THE BASELINED VERSION OF THE PAYLOAD COMMAND DATABASE (CDB) AND TELEMETRY DATABASE (TDB).

D. PROCEDURES SHALL BE CERTIFIED FOR NON-INTERFERENCE WITH OTHER PAYLOADS.

E. PROCEDURES SHALL BE CERTIFIED TO SUCCESSFULLY EXECUTE WITHIN THE PAYLOAD MULITPLEXER/DEMULTIPLEXER (MDM) TIMELINER EXECUTOR.

F. PROCEDURES SHALL BE CERTIFIED THAT THE AUTOMATED PROCEDURE WILL NOT BE LARGER THAN (TBD) KILOBITS (KBS) AND EXECUTE NO LONGER THAN THE PLANNED ACTIVITY DURATION.

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

SECTION N5 - CREW PROCEDURES

N5.1-1 NASA PAYLOAD PROCEDURES

ALL NASA-CONTROLLED PAYLOAD PROCEDURES SHALL BE DEVELOPED AND MAINTAINED IN ACCORDANCE WITH THE U.S. PAYLOAD OPERATIONS DATA FILE (PODF) MANAGEMENT PLAN, SSP 58700, MAIN VOLUME.

FLIGHT/INCREMENT APPLICABILITY: Generic

N5.1-2 U.S. PODF ADMINISTRATIVE DATA

EACH PAYLOAD SHALL:

A. DEVELOP AND DELIVER A VALIDATION PLAN.

B. DELIVER A VALIDATION RECORD FOR EACH U.S. PODF PROCEDURE AND DISPLAY.

Rationale: A validation record can apply to multiple procedures if the procedures are: (1) on the same increment (or are generic), (2) validated in the same manner, (3) validated during the same session, (4) validated by the same participants and (5) have the same levels of approval.

C. DELIVER A HAZARD CORRELATION REPORT.

Rationale: Each U.S. PODF procedure has administrative management data maintained in the Payload Information Management System (PIMS). This data is the responsibility of the PD and must be maintained to ensure that an accurate, accountable audit trail is established in the event of an in-flight anomaly. The records must be kept current with existing procedures and must reflect any changes to these procedures. The format for the procedure validation record and the validation plan is documented in U.S. PODF Management Plan, Annex 3, U.S. PODF Procedure Verification and Validation Plan, SSP 58700-ANX3.

DOCUMENTATION: EHS Build 4.1 Document Configuration Management (DCM) and EHS Build 4.2 DCM Messaging

FLIGHT/INCREMENT APPLICABILITY: Generic

N5.1-3 PREREQUISITE FOR OPERATION OF A PAYLOAD BY A CREW MEMBER

THE NOMINAL OPERATION OF EACH NASA PAYLOAD THAT REQUIRES CREW INTERACTION WILL BE SCHEDULED IN ACCORDANCE WITH THE

INCREMENT-SPECIFIC CREW TRAINING MATRIX. NOMINALLY, A CREW MEMBER WILL ONLY BE SCHEDULED TO PERFORM TASKS THAT HE/SHE IS TRAINED TO PERFORM. THIS MATRIX APPEARS IN APPENDIX F OF THIS DOCUMENT AND WILL BE UPDATED ON CONSOLE.

Rationale: This process was developed to ensure that realtime scheduling is performed in accordance with the crew training outcome as documented in the Pre-increment Crew Training Phase. The Crew Training Matrix, which is built and maintained by the PAYCOM, identifies which crew members have been trained on which payloads. In the event that the Crew Training Matrix does not support the current realtime conditions it is incumbent upon the PD to identify any modifications to the matrix and submit an OCR for scheduling any additional training requirements. Upon successful completion of any onboard crew training, the PAYCOM will be responsible for making the necessary updates to the Crew Training Matrix.

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

SECTION N6 - COMMAND & DATA HANDLING (C&DH)

N6.1-1 AUTOMATED PAYLOAD SWITCH (APS) CONFIGURATION

THE APS SHALL NOT BE CONFIGURED WITH MORE THAN 20 SIMULTANEOUS CONNECTIONS.

Rationale: Two APSs provide the routing mechanism between data sources and destinations via the High Rate Data Links (HRDL). Each APS can support a maximum of 20 simultaneous connections at a data signaling rate of 125 MHz. In the event that more than 20 connections are made to the APS simultaneously, a thermal overload will occur resulting in APS shutdown.

FLIGHT/INCREMENT APPLICABILITY: Generic

N6.1-2 PAYLOAD ETHERNET HUB/GATEWAY (PEHG) BRIDGING

DURING NOMINAL OPERATIONS, THE PHYSICAL INTERFACE BETWEEN THE PEHGs WILL BE DISABLED IN ORDER TO MAINTAIN SEPARATE COLLISION DOMAINS BETWEEN THE LOCAL AREA NETWORKS (LAN).

Rationale: Two PEHGs provide the IEEE 802.3 LAN interfaces to the International Standard Payload Racks (ISPR) within the U.S. Lab.

FLIGHT/INCREMENT APPLICABILITY: Generic

N6.1-3 HAZARDOUS COMMAND OPERATIONS

HAZARDOUS PAYLOAD COMMANDS SHALL BE APPROVED BY THE POD PRIOR TO UPLINK. FOR U.S. PAYLOADS, ALL HAZARDOUS PAYLOAD COMMANDS SHALL ORIGINATE FROM THE POIC.

Rationale: All payload hazardous commands shall be coordinated within the issuing control center and authorized by the POD. The POD will in turn coordinate with the Flight Director at the lead control center. It is the responsibility of the lead control center to coordinate hazardous commands with the flight crew. The issuing control center operators must implement a system and procedures for realtime monitoring of all safety-related telemetry during hazardous command activity. These procedures must allow sufficient time between transmission of each command in order to terminate commanding, if necessary, before transmission of a subsequent hazardous command.

DOCUMENTATION: SPIP Volume 9, Section 5.1

FLIGHT/INCREMENT APPLICABILITY: 6A and subs

PAYLOAD REGULATIONS

N6.1-4 PAYLOAD ETHERNET HUB/GATEWAY (PEHG) FLOW CONTROL COMMAND

DURING NOMINAL OPERATIONS, THE PEHG FLOW CONTROL COMMAND WITHIN THE PEHG GATEWAY COMMAND WILL NOT BE ENABLED WITHOUT DIRECTION FROM THE POD.

Rationale: If the PEHG Gateway is overflowing, the PEHGs have the ability to control the ethernet traffic via enabling PEHG Flow Control Command. However, this command can affect other payloads on the LAN. The DMC or PRO should attempt to identify the payload(s) causing the overflow condition before enabling flow control. This command can effectively stop a payload's access to the LAN, thus stopping the payload's medium rate downlink.

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

SECTION N7 - COMMUNICATIONS & TRACKING

~~RESERVED~~

N7.1-1 MCOR RECORDING AND PLAYBACK CAPABILITIES

DURING NOMINAL OPERATIONS, THE MCOR WILL RECORD ALL LOS PERIODS. THE MCOR DATA PLAYBACKS SHOULD BE PERFORMED APPROXIMATELY ONCE EVERY 3 REVS OR APPROXIMATELY EVERY 4.5 HOURS. THE PLAYBACK TIMES CAN VARY DEPENDING ON THE AVAILABLE TDRS COVERAGE AND PAYLOAD REQUIREMENTS.

THE MCOR DOES NOT PROVIDE LONG TERM STORAGE OF DATA, BUT WILL MAINTAIN ONE PREVIOUS DATA PLAYBACK SEGMENT AS TEMPORARY STORAGE DURING NORMAL OPERATIONS. THE TEMPORARY STORAGE IS TO ENSURE THE GROUND SITES RECEIVE THEIR PLAYBACK DATA FROM PDSS. THE MCOR DATA FROM THE PREVIOUS PLAYBACK WILL BE UNPROTECTED BEFORE THE NEXT MCOR DATA PLAYBACK.

Rationale: The MCOR is used only for short-term storage of LOS data and should not be used as a long-term storage device for payload data.

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

SECTION N8 - RESOURCE MANAGEMENT

N8.1 NOMINAL OPERATIONS

N8.1-1 OPERATION WITHIN PAYLOAD RESOURCE ENVELOPES

EACH NASA PAYLOAD SHALL CONDUCT PAYLOAD OPERATIONS SUCH THAT THE RESOURCES USED ARE LESS THAN OR EQUAL TO THE RESOURCE DISTRIBUTED TO THAT PAYLOAD DURING THE SHORT-TERM PLANNING PROCESS.

Rationale: To assure that overall payload resource usage does not exceed POIC allocations and constraints, payloads must ensure that they do not exceed their resource envelope.

DOCUMENTATION: Multilateral Payload Regulation, M8.1-2

FLIGHT/INCREMENT APPLICABILITY: Generic

N8.1-2 NITROGEN AVAILABILITY

TOTAL NITROGEN UTILIZATION WILL BE LIMITED TO AN AVERAGE OF 10 LBM PER 90 DAYS.

Rationale: This limit is based on nitrogen logistics and airlock pressure tank capacity.

FLIGHT/INCREMENT APPLICABILITY: 7A.1 to UF-3

N8.1-3 WATER AVAILABILITY

PAYLOADS WILL OBTAIN WATER FROM THE SHUTTLE GALLEY AND WILL BE RESPONSIBLE FOR PROVIDING A CONTAINER TO HOLD THE WATER AND FOR CONDITIONING THE WATER OR BE COMPATIBLE WITH N8.1-6.

Rationale: The only water source prior to Node 3 is the Russian water system and the Shuttle. The RSA is not responsible for providing water for U.S. payloads.

FLIGHT/INCREMENT APPLICABILITY: 7A.1 through 20A

N8.1-4 WATER TRANSPORT

NASA PAYLOADS REQUIRING POTABLE WATER WILL PROVIDE STOWAGE CONTAINERS OR UTILIZE THE CONTINGENCY WATER CONTAINER (CWC) BAGS.

Rationale: CWCs are the only ISS-provided stowage containers for potable water available. In lieu of CWCs, payloads may develop and qualify unique stowage containers for potable water.

FLIGHT/INCREMENT APPLICABILITY: Generic

N8.1-5 COMMUNICATIONS COVERAGE FOR INITIAL ACTIVATION ACTIVITIES

THE LAST 15 MINUTES OF INITIAL ACTIVATIONS FOR ALL RACKS AND SUBRACK PAYLOADS THAT PROVIDE HEALTH AND STATUS TO THE GROUND SHOULD BE SCHEDULED TO OCCUR OVER COMBINED TDRS S-BAND AND KU-BAND.

Rationale: Communications coverage is needed to assure that the ground can monitor the initial power draw of the rack or subrack payload in order to perform ground commanding required to start the onboard polling of Health and Status data. Once this commanding is complete, the ground will be able to monitor Health and Status parameters which are not available to the crew.

FLIGHT/INCREMENT APPLICABILITY: I2 and subs

N8.1-6 COMMUNICATIONS COVERAGE FOR FINAL DEACTIVATION ACTIVITIES

THE LAST 10 MINUTES OF FINAL DEACTIVATIONS FOR ALL RACKS AND SUBRACK PAYLOADS THAT PROVIDE HEALTH AND STATUS TO THE GROUND SHOULD BE SCHEDULED TO OCCUR OVER COMBINED TDRS S-BAND AND KU-BAND.

Rationale: Communications coverage is needed to assure to assure that the ground can monitor the release of power to the rack or subrack payload in order to perform ground commanding required to stop the onboard polling of Health and Status data.

FLIGHT/INCREMENT APPLICABILITY: I2 and subs

N8.2 DEVIATIONS FROM BASELINE

N8.2-1 CHANGES TO PAYLOAD RESOURCE ENVELOPES

A. ALL CHANGES TO NASA PAYLOAD RESOURCE ENVELOPES SHALL BE COORDINATED WITH AND APPROVED BY THE POIC.

B. ALL HARDWARE MALFUNCTION/TROUBLESHOOTING/CORRECTION CREW TIME WILL COME OUT OF THAT PAYLOAD'S REGULAR OPS ALLOCATION.

C. PAYLOAD USERS WILL BE RESPONSIBLE FOR THE DEVELOPMENT AND VALIDATION OF ALL CORRECTIVE PROCEDURES.

Rationale: The POIC must maintain cognizance of payload resources and assignments as defined in the STP. POIC resource tracking is necessary to ensure traceability of the quantities of resources distributed to the NASA payloads. See regulation N4.1-2 regarding the applicable procedure certification criteria.

FLIGHT/INCREMENT APPLICABILITY: Generic

N8.2-2 ADDITIONAL PAYLOAD RESOURCES

IF ADDITIONAL RESOURCES BECOME AVAILABLE FOR NASA PAYLOAD OPERATIONS PRIOR TO THE IEPT THAT BEGINS AN STP CYCLE, THE POIC WILL DISTRIBUTE THOSE RESOURCES TO THE NASA PAYLOADS BASED ON CURRENT LIS SCIENCE GUIDELINES AND PRIORITIES. ADDITIONAL SHARED RESOURCES THAT BECOME AVAILABLE FOR PAYLOAD OPERATIONS AFTER THE STP CYCLE HAS BEGUN WILL BE RESERVED FOR CREW TASK LIST ACTIVITIES.

IF ADDITIONAL RESOURCES OUTSIDE OF POIC CONTROL ARE REQUIRED TO PERFORM NASA PAYLOAD OPERATIONS WHICH ARE CRITICAL TO ACHIEVING REQUIRED SCIENCE OBJECTIVES OR WHICH WILL SUBSTANTIALLY MINIMIZE REPLANNING OF PAYLOAD ACTIVITIES, THE POIC WILL REQUEST ADDITIONAL RESOURCES AND DISTRIBUTE AS NEEDED.

Rationale: The replanning approach is to minimize replanning during realtime and to avoid re-distribution of resources due to time constraints. Utilization of additional resources may entail additional use of other resources jeopardizing existing resource envelopes. The crew maintains a list of job jar activities which may be performed if extra time and resources become available.

FLIGHT/INCREMENT APPLICABILITY: Generic

N8.2-3 PAYLOAD RESOURCES DURING TROUBLESHOOTING

RESOURCES REQUIRED TO SUPPORT PAYLOAD TROUBLESHOOTING ACTIVITIES MUST NOT INTERFERE WITH ANOTHER PAYLOAD'S OPERATIONS WITHOUT POD AND LIS APPROVAL. TOTAL NASA PAYLOAD RESOURCE USAGE SHOULD NOT EXCEED THE NASA PARTNER RESOURCE DISTRIBUTION.

Rationale: Resources are allocated to optimize payload operations objectives. Any additional POIC-controlled resources required to support payload troubleshooting activities will be assessed after receiving a formal request by the payload.

FLIGHT/INCREMENT APPLICABILITY: Generic

N8.2-4 PAYLOAD ACTIVITY TRACKING

PAYLOAD OPERATIONS TEAMS ARE RESPONSIBLE FOR TRACKING AND REPORTING THEIR PAYLOAD SCIENCE PROGRESS, ACCOMPLISHMENTS, AND ANOMALIES.

Rationale: Payload progress and accomplishments may be considered by the LIS when establishing payload guidelines and priorities.

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

SECTION N9 - PAYLOAD SUPPORT SYSTEMS (PLSS)

N9.1 GENERAL PLSS

N9.1-1 NOMINAL PLSS OPERATIONS FOR PAYLOADS

THEPOIC IS RESPONSIBLE FOR THE NORMAL OPERATIONS OF PLSS IN SUPPORT OF PAYLOAD OPERATIONS AS FOLLOWS:

A. VACUUM SYSTEM

1. COORDINATING OPERATING MODE CHANGES

2. RACK ISOLATION VALVE (RIV) OPERATION

B. LAB NITROGEN SYSTEM

1. COORDINATING OPERATING MODE CHANGES

C. POTABLE WATER SYSTEM

1. COORDINATING AVAILABILITY AND UTILIZATION

D. THERMAL CONTROL SYSTEM

1. RACK FLOW CONTROL ASSEMBLY (RFCA) OPERATION

E. ELECTRICAL POWER SYSTEM

1. REMOTE POWER CONTROLLER(RPC) OPERATION

Rationale: Nominal control operations are those operations which change the configuration status of the PLSS components in support of payload operations. Nominal operations are defined in the PLSS or payload nominal procedures.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.1-2 PLSS ACTIVATION

THE POIC MAY NOT ACTIVATE PLSS COMPONENTS WITHOUT AUTHORIZATION BY THE MCC-H.

Rationale: PLSS components will be activated by the MCC-H in support of payload operations prior to the time at which the PLSS is needed at the request of the POIC and in accordance with nominal Joint Operations Interface Procedures (JOIP).

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.2 ELECTRICAL POWER SYSTEM

N9.2-1 SECONDARY POWER DISTRIBUTION RESPONSIBILITIES

THE POIC IS RESPONSIBLE FOR SECONDARY POWER DISTRIBUTION TO U.S. LAB ISPR PAYLOAD LOCATIONS AND EXTERNAL TRUSS PAYLOAD LOCATIONS. POIC RESPONSIBILITY IS LIMITED TO PAYLOAD OPERATIONS AND INCLUDES THE FOLLOWING FUNCTIONS:

A. SCHEDULING TO ENSURE PAYLOAD OPERATIONS ARE SATISFIED WITHIN THE RESOURCE CONSTRAINTS.

B. INTEGRATION AND VERIFICATION TO ENSURE PAYLOAD OPERATIONS SATISFY INTERFACE AND SAFETY REQUIREMENTS.

C. REMOTE POWER CONTROLLER (RPC) OPERATION.

D. ISPR SAFING

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.2-2 ISPR POWER

THE U.S. LAB WILL PROVIDE FIVE 3 KW, FIVE 6 KW AND THREE 12 KW ISPR LOCATIONS. EACH OF THESE ISPR LOCATIONS RECEIVES TWO (MAIN AND SAFING) 120 V POWER FEEDS. THE POWER FEED CURRENT RATINGS ARE AS FOLLOWS (IN AMPERES, A):

A. 3 KW ISPR – 25 A MAIN; 12 A SAFING

B. 6 KW ISPR – 50 A MAIN; 12 A SAFING

C. 12 KW ISPR – TWO 50 A MAINS

Rationale: The U.S. Lab provides 13 ISPR locations with varying power resource capabilities.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.2-3 LOAD SHEDDING

THE POIC WILL DEFINE AND MAINTAIN REALTIME PRIORITIES ASSOCIATED WITH THE RACKS AND PAYLOAD LOCATIONS, AS DEFINED BY THE LIS, INCLUDING PAYLOAD SUPPORT EQUIPMENT (PSE), TO BE INCLUDED IN THE LOAD SHED TABLES.

Rationale: Load shedding is performed automatically by the Command and Control (C&C) MDMs to satisfy power management requirements. Load shed tables are stored on the C&C MDMs for each primary power distribution channel. Each load shed table includes a payload block for payloads and PLSS.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.2-4 TRACKING OF CONTINUOUS PLSS RESOURCES

A TOTAL OF 363 W OF POWER FOR PLSS WILL BE TRACKED CONTINUOUSLY IN THE PAYLOAD PLANS. THE SYSTEMS AND POWER BEING ACCOUNTED FOR INCLUDE: VSU2 (20 W) AND VACUUM SYSTEM (81 W) ON DDCU LA1B; VBSP (72 W), COR (100 W), AND VSU1 AND 3 (20 W EACH) ON DDCU LA2B; VTR1 (25 W) ON DDCU LA2A_3B; VTR2 (25 W ON DDCU LA1A_4A).

Rationale: Payload PLSS power not accounted for in the Systems Basic Station allocation must be tracked in the payload plans.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.3 THERMAL CONTROL SYSTEM

N9.3-1 POIC RESPONSIBILITY FOR THE THERMAL CONTROL SYSTEM

THE POIC IS RESPONSIBLE FOR OPERATION OF THE RACK FLOW CONTROL ASSEMBLIES (RFCA) DURING NOMINAL ISS THERMAL CONTROL SYSTEM OPERATIONS.

Rationale: The POIC will perform realtime coordination and replanning of thermal resource utilization for NASA payloads. The POIC will configure thermal resource distributions both within EXPRESS payload racks and among NASA payload racks. The POIC will monitor thermal control system performance.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.3-2 COOLING WATER TEMPERATURE

THE MINIMUM DIFFERENTIAL TEMPERATURE BETWEEN THE INLET AND OUTLET OF A PAYLOAD RACK USING THE MODERATE TEMPERATURE LOOP MUST BE 35°F (1.67°C) WHENEVER THE ELECTRICAL POWER LEVEL EXCEEDS 1025 W. FOR POWER LEVELS BELOW THE 1025 W LIMIT, A FLOW OF 100 LBM/HR (45.36 KG/HR) IS PROVIDED.

Rationale: Flow rate limitations on the payload rack have led to development of a differential temperature requirement. In the event that a payload cannot achieve that temperature difference, a waiver may be requested.

DOCUMENTATION: "Operations Guidelines and Constraints Element-Level Report for Stage 5A.1", SSP 57500-Final Update

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.3-3 THERMAL SYSTEM CONSTRAINTS

THE THERMAL RESOURCES AVAILABLE FOR PAYLOAD OPERATIONS FOLLOWING ~~6A AND~~ 7A.1 SHUTTLE DEPARTURE~~S~~ ARE AS FOLLOWS:

~~A. FOR 6A STAGE:~~

~~1.RACK COOLANT FLOW RATE FOR LOW TEMPERATURE LOOP (LTL) IS 890 LBM/HR.~~

~~2.RACK COOLANT FLOW RATE FOR MODERATE TEMPERATURE LOOP (MTL) IS 745 LBM/HR.~~

~~3.~~1. ~~CABIN HEAT REJECTION IS 500 W.~~

~~B~~A. FOR 7A.1 STAGE:

~~1.RACK COOLANT FLOW RATE FOR LTL IS 390 LBM/HR.~~1.MTL RACK COOLANT FLOW RATE IS 850 LBM/HR (386 KG/HR) WHEN THE US AIRLOCK IS IN HOUSEKEEPING MODE OR 700 LBM/HR (318 KG/HR) WHEN THE US AIRLOCK IS OPERATING.

~~2. RACK COOLANT FLOW RATE FOR MTL IS 545 LBM/HR.~~2. MTL HEAT REJECTION IS 6600 W NOMINALLY BUT IS ONLY 2600 W WHEN THE BETA ANGLE IS ABOVE 52 DEGREES.

~~3.~~3.CABIN HEAT REJECTION IS 500 W. CABIN HEAT REJECTION IS INCREASED TO 918 W WHEN DUAL COMMON CABIN AIR ASSEMBLIES (CCAAs) ARE OPERATING.

IF UPDATED VALUES ARE DETERMINED BASED ON RESULTS OF THE SYSTEMS PLAN, THE UPDATED VALUES WILL BE USED.

Rationale: Thermal system constraints cannot be exceeded during payload operations.

FLIGHT/INCREMENT APPLICABILITY: Flight ~~6A and~~ 7A.1 stage~~s~~ of Increment ~~2~~3

N9.4 VACUUM SYSTEM

N9.4-1 POIC RESPONSIBLITY FOR THE VACUUM SYSTEM

THE POIC IS RESPONSIBLE FOR ENSURING PROPER OPERATION AND CONFIGURATION OF THE VACUUM SYSTEM TO SUPPORT PAYLOAD OPERATIONS.

Rationale: The POIC will perform realtime coordination and replanning of the vacuum system operations for payloads operating in the NASA segment.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.4-2 PAYLOAD VACUUM COMMANDING

PDs SHALL NOT COMMAND OPEN INTERNAL VACUUM VALVES UNTIL DIRECTED BY THE POIC.

Rationale: Prior to payload venting activities the PRO must ensure that all vacuum systems are configured properly.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.4-3 VRS CONNECTION CONSTRAINTS

NASA PAYLOAD CONNECTION TO THE VRS WILL BE ALLOWED UNDER THE FOLLOWING CONSTRAINTS:

A. THE VRS EQUIPMENT AND ELECTRONICS ARE ACTIVE AND OPERATING NOMINALLY.

B. THE VRS PRESSURE IS 1E-3 TORR OR LESS.

C. THERE ARE LESS THAN SIX PAYLOAD USERS ACTIVELY CONNECTED.

D. THE PAYLOAD PRESSURE IS KNOWN TO BE 1E-3 TORR OR LESS.

Rationale: These constraints are agreed to by the POIC and MCC-H for VRS operations. The constraints apply to payloads which are certified for VRS operations.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.4-4 VRS OPERATIONS

PAYLOADS NOT IN COMPLIANCE WITH N9.4-3 ARE REQUIRED TO BLOWDOWN IN THE VES PRIOR TO CONNECTION TO THE VRS. COMPLIANCE WILL BE VERIFIED PRIOR TO CONNECTIONS TO THE VRS.

Rationale: Blowdown using the VES will ensure that the VRS will not become contaminated with payload constituents. Blowdown operations will be assessed by the POIC to ensure compatibility with planned payload operations.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.4-5 VRS UTILIZATION

THE POIC WILL BE ALLOWED TO CONTINUE PAYLOAD OPERATIONS USING THE VRS UNDER THE FOLLOWING NOMINAL CONDITIONS:

A. VRS LEAK DETECTION IS ACTIVE.

B. THE VACUUM SYSTEM LOAD CONTROL ASSEMBLY (LCA) IS NOMINAL.

C. THE VRS VENT VALVE IS OPEN.

D. NO LEAK IS DETECTED IN THE VRS.

E. COMPLIANCE WITH N9.4-4 IS MAINTAINED.

Rationale: The constraints for VRS operation are monitored by the control software. Automatic safing will close the VRS vent valve in the event of a large leak (as defined by the Software Specification Requirements Document) or issue alarms in the event of a constraint violation. A vacuum system anomaly would be indicated in the event that the above conditions are not satisfied and the automatic control system fails to issue an alarm or terminate VRS utilization.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.4-6 VRS OPERATIONS MONITORING

THE POIC WILL MONITOR THE FIRST 1/2 HOUR OF PAYLOAD CONNECTION TO THE VRS FOR EACH APPLICATION OF VACUUM TO A PAYLOAD.

Rationale: In the event of a payload leak when connected to the vacuum system, cabin air may be exhausted. 1/2 hour monitoring after the application of vacuum will allow for the verification of nominal payload operation.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.4-7 VES CONNECTION CONSTRAINTS

NASA PAYLOAD CONNECTION TO THE VES WILL BE ALLOWED UNDER THE FOLLOWING CONSTRAINTS:

A. THE VES EQUIPMENT AND ELECTRONICS ARE ACTIVE AND OPERATING NOMINALLY.

B. THE VES PRESSURE IS 1E-3 TORR OR LESS.

C. ALL RACK ISOLATION VALVES (RIV) ARE CLOSED.

D. NO OTHER PAYLOAD USERS ARE ACTIVELY CONNECTED.

E. THE PAYLOAD USER'S EXHAUST PRODUCTS HAVE BEEN APPROVED.

Rationale: These constraints are agreed to by the POIC and MCC-H for VES operations. The constraints apply to payloads which are certified for VES operations.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.4-8 VES UTILIZATION

THE POIC WILL BE ALLOWED TO CONTINUE PAYLOAD OPERATIONS USING THE VES UNDER THE FOLLOWING NOMINAL CONDITIONS:

A. VES LEAK DETECTION IS ACTIVE.

B. THE VACUUM SYSTEM LCA IS NOMINAL.

C. THE VES VENT VALVE IS OPEN.

D. NO LEAK IS DETECTED IN THE VES.

E. THE RIVs ARE NOMINAL.

F. CONTINUED COMPLIANCE WITH U9.4-7 A, B, D, E

Rationale: The constraints for VES operation are monitored by the control software. Automatic safing will close the VES vent valve in the event of a large leak (as defined by the Software Specification Requirements Document) or issue alarms in the event of a constraint violation. A vacuum system anomaly will be indicated in the event that the conditions are not satisfied and the automatic control system fails to issue an alarm or terminate VES utilization.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.4-9 VES BLOWDOWN MONITORING

THE POIC WILL MONITOR PAYLOAD CONTINUOUS VENTING UNTIL THE PRESSURE IS LESS THAN 1E-3 TORR THROUGH THE VES FOR EACH APPLICATION OF VACUUM TO A PAYLOAD.

Rationale: In the event of a payload leak when connected to the vacuum system, cabin air may be exhausted. Monitoring the exhaust rate for comparison against the predicted process rate will aid in leak detection during the blowdown process. If actual process values exceed the predicted values, the vacuum system leak detection system may indicate a problem that will need resolution by the POIC and/or MCC-H. The monitoring period will allow for verification of nominal payload operations.

N9.5 LABORATORY NITROGEN SYSTEM (LNS)

N9.5-1 PAYLOAD ACCESS TO THE LNS

PAYLOAD UTILIZATION OF THE LNS SYSTEM IS CONTINGENT ON THE NOMINAL OPERATION OF THE ATMOSPHERIC CONTROL AND SUPPLY (ACS) SYSTEM.

Rationale: The ACS has a primary critical function of controlling the atmospheric pressure and mixture in the U.S. Lab; therefore, the LNS to payloads is considered a secondary ACS function. The LNS NIV will be open at all times allowing payload access under nominal operating conditions.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.5-2 LNS AVAILABILITY

THE POIC WILL PROVIDE NOTIFICATION TO THE MCC-H FOR PAYLOAD PLANS TO UTILIZE THE LNS.

Rationale: A cumulative limit usage of 49 lbm over a 90-day period is imposed by MCC-H. Notification of payload operations will enable the MCC-H personnel to status and monitor GN_2 resource utilization. In addition, all command functions are performed by the MCC-H, and the LNS must be in the Introduction mode for nominal payload operations.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.5-3 NITROGEN RELEASE TO CABIN

UNAUTHORIZED RELEASE OF NITROGEN THROUGH PAYLOAD LEAKAGE OR AS A WASTE PRODUCT TO THE LAB ATMOSPHERE IS PROHIBITED.

Rationale: Isolation of a leak to a NASA payload will require payload correction/resolution of the leak prior to reconnect to the LNS. Waste GN_2 will be expelled through the VES or expelled as an approved cabin air exhaust accommodated as a nominal function of the ACS cabin pressure control.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.6 POTABLE WATER SYSTEM

N9.6-1 UTILIZATION OF POTABLE WATER RESOURCE

NASA PAYLOADS MUST HAVE AN APPROVED WASTE WATER DISPOSAL PLAN IN PLACE PRIOR TO UTILIZATION OF THE POTABLE WATER RESOURCE.

Rationale: Disposal of waste water after usage is the responsibility of the payload. Venting through the VES is not an option.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.6-2 POTABLE WATER AVAILABILITY

THE POIC WILL PROVIDE NOTIFICATION TO MCC-H FOR PAYLOAD PLANS TO USE THE POTABLE WATER SYSTEM.

Rationale: Water usage is based on a daily average evaluated on a weekly basis. Water usage excluding the return to cabin air as humidity is limited to 4.8 lbm/day. Notification of payload operations will enable the MCC-H personnel to monitor water resource utilization. This regulation will be implemented in accordance with N8.1-5, Water Availability, and N8.1-6, Water Transport.

FLIGHT/INCREMENT APPLICABILITY: Generic

N9.6-3 POTABLE WATER RELEASE TO CABIN

A. IN THE EVENT OF A PAYLOAD WATER LEAK, OPERATIONS WILL CEASE PENDING LEAK ISOLATION AND CORRECTION.

B. PAYLOAD RELEASE OF WATER AS A WASTE PRODUCT IS PROHIBITED.

Rationale: Isolation of a leak to a NASA payload will require payload correction/resolution of the leak prior to resumption of operations. Waste water will be dispositioned per the waste water disposal plan.

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

SECTION N10 - LABORATORY SUPPORT EQUIPMENT (LSE)

N10.1-1 DEFINITIONS

A. LSE IS EQUIPMENT THAT IS SHARED WITH ALL NASA PAYLOAD USERS.

B. PSE IS EQUIPMENT THAT IS DEDICATED TO A SPECIFIC PAYLOAD USER.

C. STATION SUPPORT EQUIPMENT (SSE) IS EQUIPMENT THAT IS SHARED WITH PAYLOADS/SYSTEMS/CREW USERS.

FLIGHT/INCREMENT APPLICABILITY: Generic

N10.1-2 LSE SCHEDULING

THE POIC WILL COORDINATE AND SCHEDULE WITH THE USERS THE USE OF LSE FOR NASA PAYLOADS.

Rationale: Payload users will identify their requirements for shared equipment as input to the planning process. The POIC is responsible for managing the payload utilization of this resource.

FLIGHT/INCREMENT APPLICABILITY: Generic

N10.1-3 CREW HEALTH CARE SYSTEM (CHeCS) USE OF LSE

CHeCS WILL USE THE FOLLOWING LSE:

A. MINUS EIGHTY DEGREE LABORATORY FREEZER FOR THE INTERNATIONAL SPACE STATION (MELFI) [NOT AVAILABLE UNTIL UF-2]

B. COMPOUND MICROSCOPE/35MM CAMERA [NOT AVAILABLE UNTIL UF-3]

Rationale: These uses are documented in the Memorandum of Agreement (MOA) among CHeCS, Human Research Facility (HRF), Biological Research Project (BRP), Astronaut Office, ISS Vehicle Office, and ISS Payloads Office for sharing equipment on ISS. CHeCs will use the compound microscope and 35mm camera to observe cultured slides after incubation. The MELFI will be used for +4 °C stowage of microbiology consumables, archived isolates, and

water samples. MELFI Dewar availability is subject to power availability from the Mini-Pressurized Logistic Module (MPLM) and U.S. Lab.

FLIGHT/INCREMENT APPLICABILITY: UF-2 and subs

PAYLOAD REGULATIONS

SECTION N11 - EXPRESS

N11.1-1 EXPRESS RACK MODES

EXPRESS RACK MODES ARE AS FOLLOWS:

A. INITIALIZATION

B. STANDBY

C. OPERATE

D. SHUTDOWN

Rationale: During increment or flight operations, it is necessary to use common terminology when referring to EXPRESS payload operations. The Initialization mode is automatically entered into following rack power up and entails Rack Interface Controller (RIC) establishing communication to rack avionics. The Standby mode is entered into to support configuration table modification. Operate is the nominal operating mode for conducting rack and payload activities. Shutdown mode is entered into to terminate RIC and rack avionics power services, to support rack deactivation.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-2 EXPRESS MEMORY UNIT (EMU)

THE EMU WILL NOT BE UTILIZED TO STORE EXPRESS SUBRACK PAYLOAD SOFTWARE.

Rationale: The EMU provides storage for RIC software, RIC Configuration Tables, and serves as a temporary staging area for file transfer activities.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-3 EXPRESS HEALTH AND STATUS TELEMETRY

EXPRESS PAYLOAD(S) MUST PROVIDE HEALTH AND STATUS TELEMETRY FOR USE BY THE CREW AND POIC. PAYLOAD HEALTH AND STATUS DATA IS NOT DISPLAYED ON THE PCS.

Rationale: EXPRESS payload health and status data will be monitored by the crew via the Portable Computer System (PCS) and/or Payload Rack Officer (PRO) during flight operations. Payload health and status telemetry must be in MSFC-STD-1274 formatting for processing on the PCS and in the POIC.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-4 MIDDECK LOCKER(MDL)/INTERNATIONAL SUBRACK INTERFACE STANDARD (ISIS) DRAWER

EXPRESS MDL AND ISIS DRAWER PAYLOADS MUST PROVIDE TELEMETRY MONITORING OF SAFETY-CRITICAL PARAMETERS AND MUST PROVIDE FOR AUTOMATIC SAFING AND/OR CREW NOTIFICATION IN THE EVENT OF AN OUT-OF-LIMIT CONDITION.

Rationale: The safety-critical telemetry parameters will be determined on a payload case-by-case basis.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-5 RACK RIC TABLE UPDATES

AS A MINIMUM, EXPRESS RACK(S) RIC TABLE UPDATES WILL BE PERFORMED WHEN CHANGING PAYLOADS.

Rationale: RIC tables consist of payload configuration files required for payload operations.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-6 POWER AND DATA PORT MANAGEMENT

THE CONFIGURATION OF THE EXPRESS RACK(S) POWER AND DATA PORTS AND THE PAYLOAD MDM CONFIGURATION TABLES WILL BE PERFORMED BY THE POIC.

Rationale: EXPRESS payload users will request the configuration and/or reconfiguration of power and data ports in accordance with pre-increment plans and agreements. The PRO will uplink the commands required to configure power and data ports. The PRO will also monitor the configuration operations.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-7 VIDEO DOWNLINK

~~ONLY ONE PAYLOAD VIDEO SIGNAL AT A TIME WILL BE DOWNLINKED~~. FROM ANY GIVEN RACK, ONLY ONE PAYLOAD VIDEO SIGNAL AT A TIME WILL BE OUTPUT TO THE STATION VIDEO SYSTEM

Rationale: The EXPRESS Common Video Interface Transmitter (CVIT) unit is capable of processing two signals at a time. The crew or ground commanding can route the selected video signal to the EXPRESS laptop display for local viewing and/or route the same/different video signal to the ground.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-8 CLEARING SSPC TRIP ERRORS

TO CLEAR SOLID-STATE POWER CONTROLLER (SSPC) TRIP ERRORS THE SOLID-STATE POWER CONTROL MODULE (SSPCM) MUST BE POWER CYCLED.

Rationale: The only method available to clear SSPC trip errors is to power cycle the SSPCM. This procedure involves removing and reapplying power to the EXPRESS rack, loading configuration tables, and activating power and communications to sub-rack payload locations. This procedure may take from 30 to 45 minutes to complete. The procedure may be delayed to pick up a good TDRSS pass so that all the commanding may be done during one pass.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-9 LAPTOP COMMUNICATIONS CONFIGURATION

LAPTOP COMMUNICATIONS CONFIGURATION SHOULD BE COMMANDED FROM ON-BOARD ONLY.

Rationale: EXPRESS Engineering recommends that changing the EXPRESS laptop comm configuration be done only from the laptop itself to reduce the likelihood of error.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-10 RACK INTERFACE CONTROLLER (RIC) REBOOT

TO RECOVER THE RIC FROM AN OFF-NOMINAL STATE A RIC REBOOT IS REQUIRED.

Rationale: The RIC can enter an off-nominal state as the result of data throughput or RIC internal card-to-card communication errors. To return the RIC to a nominal state a RIC reboot is required. RIC reboots can be autonomous (SSPCM watchdog timer initiated) or manually initiated (PRO or Crew). Using the crew is the preferred method for executing a manually initiated RIC reboot since it will have the least impact on payload operations of all the reboot methods. There are two methods available for executing a ground (PRO) initiated reboot. If the

RIC is still responsive to commands, the PRO will send the RIC reboot command. This is the preferred ground method for initiating a reboot. Prior to sending the RIC reboot command the PRO must command the rack to standby mode, otherwise the reboot command will not be accepted. To place the rack in standby mode all payloads will have to be powered off first. As a secondary method for executing a ground reboot the PRO can initiate a main-to-auxiliary, then back to main, power switch by commanding the rack main power Remote Power Controller (RPC) open and then closed again.

The effects of a RIC reboot event vary depending on how the reboot was initiated. All reboots clear the RIC volatile memory, which means that all rack and payload configuration information will be lost until the RIC can be reconfigured by the PRO. The net effect of this is that both payload health and status and science data will be lost until the RIC is reconfigured. Note, rack level health and status is available again approximately four minutes after a RIC reboot event since this data is generated and transmitted irregardless of RIC configuration. Ground initiated reboot events executed using the reboot command will entail loss of power to payloads as well as loss of data. Recovery of the rack to nominal configuration will take approximately 25 to 45 minutes. This will be followed by any necessary payload recovery activities.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-11 LOW RATE TELEMETRY SERVICE

SCIENCE TELEMETRY FROM EXPRESS SUB-RACK PAYLOADS SHALL NOT NOMINALLY BE CONFIGURED FOR LOW RATE TELEMETRY (LRT) DOWNLINK.

Rationale: LRT is intended for command and control and health and status telemetry. Over subscription of LRT may degrade the performance of the RIC. Payload science telemetry should nominally be configured for Medium Rate Telemetry (MRT) downlink.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-12 PAYLOAD ANCILLARY DATA START COMMAND

A PAYLOAD, RACK, OR FACILITY MUST ALREADY BE POWERED ON BEFORE THE ANCILLARY DATA TABLE MAY BE MODIFIED.

Rationale: The RIC starts looking for ancillary data for a sub-rack payload if it is indicated in the ancillary data table that the payload has a requirement for ancillary data. In order to not have any errors, the payload must be powered up and ready to receive the data.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.1-13 ANCILLARY DATA DISRUPTS FILE TRANSFER

ANCILLARY DATA ROUTING CANNOT BE SCHEDULED DURING A FILE TRANSFER.

Rationale: Performing ancillary data routing and file transfer activities simultaneously degrades performance of the RIC. The greatest impact occurs when transferring large files between the EMU and Payload MDM. This type of file transfer needs to be scheduled when ancillary data services can be shut down temporarily.

FLIGHT/INCREMENT APPLICABILITY: Generic

N11.2 EXPRESS PALLET

RESERVED

PAYLOAD REGULATIONS

SECTION N12 - PAYLOAD UNIQUE

N12.1-1 CHeCS USE OF HRF HARDWARE

CHeCS WILL USE THE FOLLOWING HRF HARDWARE:

A. GAS ANALYZER SYSTEM FOR METABOLIC ANALYSIS OF PHYSIOLOGY (GASMAP)

B. SPACE LINEAR ACCELERATION MASS MEASUREMENT DEVICE(SLAMMD)

Rationale: These uses are documented in the MOA among CHeCS, HRF, BRP, Astronaut Office, ISS Vehicle Office, and ISS Payloads Office for sharing equipment on ISS. Use of SLAMMD may not be required if RSA BMMD meets the CHeCS requirements.

FLIGHT/INCREMENT APPLICABILITY: Generic

N12.1-2 CHeCS USE OF BRP HARDWARE

CHeCS WILL USE THE BRP LIFE SCIENCES GLOVEBOX.

Rationale: This use is documented in the MOA among CHeCS, HRF, BRP, Astronaut Office, ISS Vehicle Office, and ISS Payloads Office for sharing equipment on ISS. CHeCS will use the life sciences glovebox: (1) as a microbial safety cabinet during preparation of surface, water, and air sample cultures and slides; (2) as a chemical containment area during preparation of and analysis with water monitor reagents (contingency use in the event of suspected chemical contamination of recovered potable water).

FLIGHT/INCREMENT APPLICABILITY: UF-3 and subs

N12.1-3 HRF USE OF CHeCS HARDWARE

HRF WILL USE THE FOLLOWING CHeCS HARDWARE:

A. CYCLE ERGOMETER (LOCATED WITHIN 6 FT OF GASMAP)

B. TREADMILL

C. RESISTIVE EXERCISE DEVICE (RED)

D. BLOOD PRESSURE/ELECTROCARDIOGRAM MONITOR.

E. PORTABLE CLINICAL BLOOD ANALYZER (PCBA)

Rationale: These uses are documented in the MOA among CHeCS, HRF, BRP, Astronaut Office, ISS Vehicle Office, and ISS Payloads Office for sharing equipment on ISS.

FLIGHT/INCREMENT APPLICABILITY: Generic

N12.1-4 BRP USE OF CHeCS HARDWARE

BRP WILL USE THE FOLLOWING CHeCS HARDWARE:

A. WATER MICROBIOLOGY KIT (CONTINGENCY USE)

B. SURFACE SAMPLER KIT

C. VOLATILE ORGANIC ANALYZER

D. MICROBIAL AIR SAMPLER

E. SPECTROPHOTOMETER (CONTINGENCY USE)

Rationale: These uses are documented in the MOA among CHeCS, HRF, BRP, Astronaut Office, ISS Vehicle Office, and ISS Payloads Office for sharing equipment on ISS.

FLIGHT/INCREMENT APPLICABILITY: UF-3 and subs

N12.1-5 ~~TIME TAG~~ COMMANDING NOT AVAILABLE DURING DIAGNOSTIC AND CheCS DUMPS

~~TIME TAG~~ COMMANDING THROUGH THE PL MDM DURING ANY MDM DIAGNOSTIC OR CheCS DUMP SHOULD BE AVOIDED BECAUSE THESE ACTIVITIES WILL NOT ALLOW ~~WILL NOT ALLOW TIME TAGGED~~ COMMANDS TO FUNCTION.

Rationale: During ISIL testing, it was discovered that ~~Time Tagged~~ Commands will not function when a CheCS Dump is in progress. The same problem will occur with a diagnostic dump of a MDM since diagnostic dumps, like CheCS dumps, insert times into the downlink packets that are not true on-board times.

FLIGHT/INCREMENT APPLICABILITY: Generic

~~N12.1-6 HRF INVESTIGATION SETUP AND ACTIVATION SCHEDULING~~

~~A. BEST EFFORT WILL BE MADE TO SCHEDULE AND PERFORM SETUP AND ACTIVATION ACTIVITIES NO LATER THAN 5A.1 UNDOCK PLUS 3 DAYS FOR:~~

~~1.BONNER BALL NEUTRON DETECTOR (BBND)~~

~~2.DOSIMETER MAPPING (DOSMAP)~~

~~*Rationale: Preflight negotiation with HRF PD reached agreement that Setup and Activation for these investigations will be scheduled as indicated to obtain highly desired science data. These activities are precluded from the Joint Operations timeframe because of required activities for crew handover and transfer.*~~

~~FLIGHT/INCREMENT APPLICABILITY: 5A.1~~

~~B. BEST EFFORT WILL BE MADE TO SCHEDULE AND PERFORM PART 2 SETUP AND ACTIVATION ACTIVITIES NO LATER THAN FLIGHT DAY 8 (FD08) OF FLIGHT 6A FOR:~~

~~1.DOSMAP~~

~~2.TORSO~~

~~*Rationale: Preflight negotiation with HRF PDs reached agreement that Part 2 Setup and Activation for these investigations will be scheduled as indicated to obtain highly desired science data. Preflight analyses indicated that it was feasible to include these in the Joint Operations timeframe unless precluded by delays in assembly and transfer tasks with high priority.*~~

~~*The PI for the TORSO experiment requires the remaining hardware to be deployed as soon as possible (no later than FD 08). The Phantom TORSO contains passive and active dosimeters. The passive ones start accumulating data as soon as they reach orbit. When the TORSO compliment of hardware is activated the active dosimeters begin accumulating data. If the hardware is deployed later then it will be difficult to make correlation between the data from passive and active dosimeters.*~~

~~*The PIs for TORSO and DOSMAP will be sharing and reviewing data from both experiments to determine if there is any correlation between the data from each experiment. The earlier the setup the lower the noise in the data. Therefore, in order to gather as much scientific data as possible and to avoid significantly impacting the quality of data return, the radiation suite is*~~

asking that the remaining setup and activation of DOSMAP and TORSO occur at the same time and as soon as possible.

FLIGHT/INCREMENT APPLICABILITY: 6A

N12.1-7 HRF RACK POWERED ON TIME

THE HRF RACK CAN BE POWERED ON FOR NO MORE THAN A TOTAL OF 8 CUMULATIVE HOURS PER DAY.

The acoustic levels produced by the HRF rack limit operation to less than 8 hours per day total (can be continuous for up to 7 hours and 59 minutes).

FLIGHT/INCREMENT APPLICABILITY: Increment 2

APPLICABILITY: Flight 6A Shuttle-ISS Joint Operations

N12.1-8 CPCG-H TRANSFER AND EARLY ACTIVATION

CPCG-H EXPERIMENT TRANSFER SHOULD OCCUR NO LATER THAN FLIGHT DAY 7(FD-7) AND EXPERIMENT ACTIVATION SHOULD OCCUR NO MORE THAN 1 HOUR AFTER THE PAYLOAD HAS BEEN TRANSFERRED FROM SHUTTLE TO ISS AND POWER RESTORED.

Rationale: Protein solutions are time-sensitive. Long sample sit time before activation results in degraded sample viability. In order to maintain sample viability, the experiment should be transferred and activated no later than FD-07. According to the protein decay curve, failure to activate the experiment by FD-07 will introduce the risk of commercial sample viability decreasing to less than 70%. At the 6A Flight Operations Review it was clear that activation could be scheduled on the day of transfer but that the one-hour constraint could not be satisfied without introducing the risk of not completing all powered payload transfers on FD-07. Transfer and installation of EXPRESS Rack 1 will be necessary beforehand to permit configuring the rack to receive CPCG-H.

REFERENCES: Increment 2 JOP held on September 2, 1999 and 6A FOR held on November 6-9, 2000.

DOCUMENTATION: Increment 2 Execute Planning Groundrules and Constraints

FLIGHT/INCREMENT APPLICABILITY: Flight 6A Shuttle-ISS Joint Operations

N12.1-9 CPCG-H LOSS OF HEALTH AND STATUS DATA

~~DURING EXPRESS RACK RIC RESET, THE CRIM-M WILL LOOSE COMMUNICATION WITH THE RIC FOR 30 MINUTES. CPCG-H WILL BE ALLOWED TO REMAIN POWERED FOR UP TO 30 MINUTES AFTER RIC RESET TO ALLOW FOR RE-SYNC WITH THE RIC AND TO RE-ESTABLISH HEALTH AND STATUS DATA FLOW. RACK COM TABLES MUST ALSO BE RELOADED DURING THIS TIME PERIOD.~~

~~*Rationale: During RIC Resets (i.e. Main-Aux Power switch) the CRIM-M will re-boot but will not synchronize with the RIC because COM tables must be reloaded by uplink command. The CRIM-M will wait 30 minutes before re-synchronizing with RIC.*~~

~~N12.1-10 CGBA ACTIVATION DURING THE JOINT OPERATIONS TIMEFRAME~~

~~CGBA ACTIVATION INCLUDES REAPPLYING POWERING TO THE CGBA FACILITY. THEREFORE, CGBA ACTIVATION OCCURS IMMEDIATELY AFTER TRANSFER TO ISS DURING THE JOINT OPERATIONS TIMEFRAME.~~

~~*Rationale: CGBA power interruption is limited to 30 minutes or less.*~~

~~FLIGHT/INCREMENT APPLICABILITY: Flight 6A~~

~~N12.1-11 CGBA RETURN LAUNCH DELAY/LANDING TIME EXTENDED~~

~~DEPENDING ON AMOUNT OF DELAY AND THE SCIENCE NEEDS, PERFORM ALTERNATE PROCEDURE "ADJUST EOM." EOM = END OF MISSION.~~

~~*Rationale: Experiment may want to take advantage of extended mission duration.*~~

~~FLIGHT/INCREMENT APPLICABILITY: Flight 6A~~

~~N12.1-12 ADVASC EXPERIMENT ACTIVATION~~

~~THE ADVASC EXPERIMENT SHALL BE ACTIVATED NO LATER THAN 17 DAYS AFTER THE FIRST LAUNCH ATTEMPT OF FLIGHT 6A.~~

~~*Rationale: The ADVASC Growth Chamber is not powered until activation. If humidity and temperature remain uncontrolled for too long the seeds may germinate early which will compromise investigation objectives. If launch is delayed more than 3.5 days, then the activation needs to be scheduled on a correspondingly earlier Flight Day. The time limit takes into account the pre-launch loading of seeds and seeks to keep the total time in uncontrolled environments*~~

~~*less than 21 days. Should the time limit be exceeded, experiment activation should be done as soon as possible to allow the PD to evaluate the condition of the investigation.*~~

~~REFERENCE: Increment 2 JOP, September 2, 1999~~

~~DOCUMENTATION: Increment 2 Execute Planning Groundrules and Constraints~~

~~FLIGHT/INCREMENT APPLICABILITY: Flight 6A and 7A/Increment 2~~

~~N12.1-13 ADVASC EXPERIMENT RESTART AFTER PREMATURE 'END EXPERIMENT'~~

~~IF THE EXPERIMENTER DETERMINES THAT 'END EXPERIMENT' AND 'YES' COMMANDS WERE EXECUTED PREMATURELY FROM THE TOUCH SCREEN, THE EXPERIMENT MAY BE RESTARTED USING THE EXPERIMENT RESUMPTION PROCEDURE (MGUEEXPRSASCC004).~~

~~*Rationale: Premature initiation of the growth termination cycle could result in science loss. This procedure needs to be performed as soon as possible and may be performed by the POIC at the PD's request.*~~

~~FLIGHT/INCREMENT APPLICABILITY: Increment 2~~

N12.1-6 DCPCG RAPID SAFING

A MINIMUM OF 3 CAPTIVE FASTENERS MUST BE SECURELY FASTENED TO PMP OR RACK BACKPLATE DURING TRANSFER OPERATIONS.

Rationale: These fasteners are needed to prevent damage to hardware

DOCUMENTATION: Also Covered In 7A.1 Flight Rules

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.1-7 DCPCG V-LOCKER LOSS OF H&S DATA

DURING AN EXPRESS RACK RIC REBOOT THE V-LOCKER WILL LOSE COMMUNICATION WITH THE RIC FOR 30 MINUTES. THE V-LOCKER WILL BE ALLOWED TO REMAIN POWERED FOR UP TO ANOTHER 30 MINUTES AFTER THE RIC REBOOT TO ALLOW RE-SYNC WITH THE RIC AND TO RE-ESTABLISH HEALTH AND STATUS (H&S) DATA FLOW.

Rationale: During RIC reboot the V-locker will reboot but will not synchronize with the RIC because COM tables must be reloaded by uplink command. The V-locker will wait 30 minutes before re-synchronizing with the RIC.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.1-8 DCPCG POWERDOWN OF LOCKERS

IN THE EVENT THAT THE DCPCG V-LOCKER LOSES POWER, OR IS POWERED DOWN INTENTIONALLY, THE C-LOCKER MUST ALSO BE POWERED DOWN.

Rationale: This action is necessary in order to prevent overheating of the V-locker

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.1-9 DCPCG EARLY START-UP AFTER UNDOCKING

THE DCPCG EXPERIMENT SET-UP SHOULD OCCUR WITHIN 24 HOURS AFTER SHUTTLE UNDOCKING.

Rationale: Protein solutions are time-sensitive. Long sample sit time before set-up and activation results in degraded sample viability.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.1-10 APCF ACTIVATION CONSTRAINTS

APCF ACTIVATIONS SHOULD OCCUR 2 TO 4 HOUR AFTER TRANSFER TO THE ISS FURING THE JOINT OPERATIONS TIMEFRAME.

Rationale: Protein solutions are time-sensitive. Long sample sit time before activation results in degraded sample viability.

DOCUMENTATION: Increment 3 Final iURC inputs.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.1-11 APCF TRANSFER CONSTRAINTS

APCF TRANSFER IS DESIRED WITHIN 12 HOURS AFTER DOCKING, BUT MUST OCCUR NO LATER THAN A NOMINAL LAUNCH + 3 DAYS, 21

HOURS. (THIS EQUATES TO SAMPLE HANDOVER + 4.5 DAYS, IF HANDOVER OCCURS AT L-17 HOURS.)

Rationale: Protein solutions are time-sensitive. Long sample sit time before activation results in degraded sample viability.

DOCUMENTATION: Increment 3 Final iURC inputs.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.1-12 BSTC ACTIVATION CONSTRAINT

BSTC ACTIVATION MUST OCCUR NO LATER THAN 12 DAYS AFTER LAUNCH OF FLIGHT 7A.1.

Rationale: This constraint is due to the nature of the cryo-preserved cell culture inoculum stowed in the Biotechnology Cell Sample Storage (BCSS) cryo-dewar. Extension of BSTC activation past 12 days will put BSTC science objectives at risk.

DOCUMENTATION: Increment 3 Final iURC inputs.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.1-134 BACKUP COMMANDING FOR EXPPCS

THE POIC WILL PERFORM COMMANDING TO BACKUP EXPPCS OPERATIONS AS INDICATED IN THE FOLLOWING TABLE:

SITUATION	POIC ACTION	PROCEDURE
UNPLANNED OR EMERGENCY SHUTDOWN	PERFORM "EXPPCS RAPID SAFING"	GROUND PROCEDURE GGUEXPRSPCSQ001
PD REQUESTS INSTRUMENT RESET – FLIGHT SYSTEM NOT RESPONDING	PERFORM " EXPPCS RESET"	GROUND PROCEDURE GGUEXPRSPCSQ002
EXPPCS PD UNABLE TO UPLINK COMMANDS BECAUSE OF COMMUNICATION PROBLEM BETWEEN GRC TSC AND MSFC POIC	PERFORM "EXPPCS COMMAND EXECUTE"	GROUND PROCEDURE GGUEXPRSPCSQ003

Rationale: This regulation documents delegation of command authority to the POIC by EXPPCS as described in NASA Payload Regulations N14.1-4 and N14.1-5.

UNPLANNED OR EMERGENCY SHUTDOWN: Procedure implements systematic powerdown of EXPPCS instrumentation and devices. This reduces the likelihood of damage or stress to electrical components. Requires approximately 10 minutes.
PD REQUESTS INSTRUMENT RESET: Procedure performs a hardware reset of EXPPCS flight unit by issuing an EXPRESS power cycle command. This will be used if EXPPCS ground commanding to reset the flight unit were not effective.
EXPPCS PD UNABLE TO UPLINK COMMANDS: Procedure allows POIC cadre to issue commands to EXPPCS flight unit in the event that EXPPCS does not have a command path from GRC TSC but MSFC POIC does. Specific command parameters will be provided to the cadre via OCR or most expedient means.

FLIGHT/INCREMENT APPLICABILITY: ~~Stage 6A and 7A~~Increments 2 and 3

N12.1-1~~4~~5 ARIS-ICE AND EXPPCS SCHEDULING CONSIDERATIONS

ON INCREMENT 2, PRIORITY WILL BE GIVEN TO COMPLETING ARIS-ICE OPERATIONS DOCUMENTED IN THE INCREMENT 2 FINAL OOS TO AVOID ADDING RISK TO EXPPCS OPERATIONS PLANNED FOR INCREMENT 3.

Rationale: The Increment 2 Final OOS was based upon ARIS-ICE performing more than half of the disturbance tests, more than half of the shaker tests and most of the hammer tests. Increment 3 would include the ARIS-ICE snubber cup test, the remainder of the hammer tests and the last shaker tests before the pushoff tests, which are the last tests to be scheduled. Shaker tests occur in three phases with at least 2 weeks of other testing between each phase and need to be completed as soon as possible.

The Increment 2 Final OOS was also based upon EXPPCS performing checkout operations and initial investigations. Slow and fast fractal studies were deferred to Increment 3 but need to begin no later than 1 August 2001 to preserve shelf life of the sample material. These studies require approximately 8 weeks of operation.

Simultaneous operations of ARIS-ICE and some EXPPCS investigation phases may be possible if microgravity disturbance to EXPPCS remains below 0.5 milli-g.

DOCUMENTATION: Email: John Uri (JSC-OZ) to Rodney Gilbert of Friday September 29, 2000, 4:35 PM, Subject: RE: Increment 2 and Increment 3 EXPPCS operations.

FLIGHT/INCREMENT APPLICABILITY: ~~Stage 6A and subsequent/~~Increment 2/Reference Info for Increment 3

N12.1-15 ACOUTIC CONSTRAINTS ON MULTIPLE RACK OPERATIONS

THE HRF RADIATION EXPERIMENT (BONNER BALL), HRF RACK 1, EXPRESS RACK 1, EXPRESS RACK 2, EXPRESS RACK 4 AND EXPRESS

RACK 5 CAN OPERATE AT THE SAME TIME WITHOUT VIOLATING ACOUSTIC CONSTRAINTS. HOWEVER, EXPRESS RACK 2 AND HRF INTEGRATED RACK SHOULD NOT BOTH BE OPERATED IN A 24 HOUR PERIOD.

Rationale: Adherence to this rule is needed to insure operation within acoustic limits.

DOCUMENTATION: Increment 3 Final iURC inputs.

APPLICABILITY: Increment 3

N12.1-16 EXPPCS AND ARIS-ICE ACOUSTIC CONSTRAINTS

EXPPCS SAMPLE CELL MIXING OPERATIONS CAN ONLY OCCUR TWICE DURING ANY 24-HOUR PERIOD FOR A TOTAL OF 120 MINUTES. THIS OPERATION AND THE ARIS-ICE SHAKER ACTIVITIES MAY NOT OCCUR WITHIN THE SAME 24-HOUR PERIOD. LIKEWISE, THE EXPPCS SEDIMENT REMOVAL MIXES CAN LAST NO MORE THAN 5 HOURS IN ANY 24-HOUR PERIOD AND MAY NOT OCCUR DURING THE SAME 24-HOUR PERIOD AS ARIS-ICE SHAKER ACTIVITIES.

Rationale: These constraints are imposed to assure operation within ISS acoustic limits.

FLIGHT/INCREMENT APPLICABILITY: Increment 3 and Subs

N12.1-17 HRF ACOUSTIC CONSTRAINTS

THE FOLLOWING TABLE LISTS THE OPERTIONAL SCENARIOS AND TIME LIMITATIONS FOR HRF EXPERIMENT HARDWARE THAT ARE NECESSARY TO REMAIN WITHIN ACOUSTIC LIMITS.

SCENARIO	POWERED TIME CONSTRAINT
HRF RACK, PC AND RACK MIXING FAN	8 HOURS PER DAY
ABOVE CONFIGURATION PLUS GASMAP	8 HOURS PER DAY
HRF RACK, PC, WORKSTATION, DISPLAY/KEYBOARD, COOLING STORAGE DRAWER AND RACK MIXING FAN	4 HOURS PER DAY
HRF RACK, PC, ULTRASOUND, DISPLAY/KEYBOARD, COOLING STORAGE DRAWER AND RACK MIXING FAN	4 HOURS PER DAY

NOTE: ONLY ONE HRF SCENARIO IS ALLOWED TO OPERATE WITHIN A 24-HOUR PERIOD.

Rationale: These constraints insure adherence to ISS acoustic limits.

FLIGHT/INCREMENT APPLICABILITY: Increment 3 and Subs

N12.1-18 HRF PUFF OPERATIONS DURING EVAs

THE PUFF EXPERIMENT REQUIRES OPERATION WITHIN ONE WEEK PRIOR TO ANY EVA AND AS SOON AS POSSIBLE AFTER AN EVA. POST-EVA OPERATIONS SHOULD OCCUR NO LATER THAN THE DAY AFTER THE EVA.

Rationale: The PuFF experiment is studying the pulmonary function of the crew. Data before and after the EVA sessions are crucial for experiment success.

FLIGHT/INCREMENT APPLICABILITY: Increment 3 and Subs

N12.1-19 EXPRESS RACK OBSTRUCTIONS

THE HRF RACK 1 LAPTOP AND ULTRASOUND KEYBOARD SHOULD NOT BE DEPLOYED IN FRONT OF EXPRESS RACK 1 SINCE EXPRESS RACK 1 WILL BE A CONTINUOUSLY POWERED RACK.

Rationale: The HRF Rack 1 laptop and ultrasound keyboard obstruct EXPRESS Rack 1 and its indicator lights.

DOCUMENTATION: Increment 3 Final Ground Rules and Constraints

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.1-20 MAMS POWER DOWN TRANSFER

BEFORE FLIGHT UF-1, MAMS HARDWARE MUST BE MOVED FROM EXPRESS RACK 1 TO EXPRESS RACK 4 AFTER ARIS-ICE OPERATIONS ARE COMPLETE. THEREFORE, NO MAMS DATA WILL BE AVAILABLE TO PAYLOADS DURING THIS TIME.

Rationale: This topology change is necessary in order to make room for continuously powered payloads that are coming off Flight UF-1 that must go into Rack 1.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.1-21 SAMS POWER DOWN TRANSFER

BEFORE FLIGHT UF-1, SAMS HARDWARE MUST BE POWERED OFF AND MOVED FROM EXPRESS RACK 2, AFTER ARIS-ICE OPERATIONS ARE

COMPLETE. THEREFORE, NO SAMS DATA WILL BE AVAILABLE TO PAYLOADS DURING THIS TIME.

Rationale: This topology change is necessary in order to make room for continuously powered payloads that are coming off Flight UF-1 that must go into Rack 1.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.2 ACTIVE RACK ISOLATION SYSTEM (ARIS)

N12.2-1 ARIS OPERATIONS

THE POIC IS RESPONSIBLE FOR THE NOMINAL OPERATION OF ARIS IN SUPPORT OF PAYLOAD OPERATIONS TO INCLUDE:

1. ARIS ACTIVATION/DEACTIVATION

2. ARIS CONFIGURATION

Rationale: Configuration and operation of ARIS are POIC responsibilities.

N12.2-2 ARIS LOCKDOWN

PRIOR TO REBOOST OR DEBRIS AVOIDANCE MANEUVERS, EACH ISPR WITH ARIS WILL HAVE ITS SNUBBERS LOCKED DOWN. WHERE SUFFICIENT TIME OR CREW RESOURCES ARE NOT AVAILABLE TO LOCK DOWN ARIS SNUBBERS, ARIS WILL BE COMMANDED TO POSITION HOLD MODE.

Rationale: Forces induced by reboost or debris avoidance maneuvers may damage components in unsecured ARIS racks. While ARIS is in the Position Hold mode, possible damage to ISPR rack components will be avoided.

FLIGHT/INCREMENT APPLICABILITY: Generic

N12.2-3 ARIS-ICE POP ACTIVATION WHEN GROUND TEAM NOT ON CONSOLE.

IN THE EVENT THAT ARIS-ICE POP LOSES POWER WHILE THE ARIS-ICE TEAM IS NOT ON CONSOLE, THE POIC PRO MAY ISSUE A COMMAND TO ACTIVATE LOCKER POWER IN ORDER TO BOOT-UP POP WITHOUT HAVING TO WAIT FOR THE ARIS-ICE TEAM TO RETURN. THE ARIS-ICE REMOTE OPS LEAD, OR DESIGNATED REPRESENTATIVE, SHOULD BE NOTIFIED THAT POWER INTERRUPTION OCCURRED.

Rationale: POP will boot and run a self-diagnostic when power is commanded to the locker. As a result, the POP will be ready for testing or troubleshooting when the next ARIS-ICE team shift begins.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.2-4 ARIS-ICE DISTURBANCE CONSTRAINT DURING RACK CHARACTERIZATION TESTS

DURING ARIS-ICE RACK CHARACTERIZATION TESTS NO ARIS RACK PAYLOADS MAY INDUCE DISTURBANCES.

Rationale: Rack characterization tests require a non-changing configuration that is not corrupted by ARIS-ICE payload disturbances or dynamics. This includes interaction with ARIS payloads by the crew.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.2-5 ARIS-ICE CONFIGURATION CONSTRAINT DURING RACK CHARACTERIZATION TESTS

DURING ARIS-ICE RACK CHARACTERIZATION TESTS, NO ARIS RACK PAYLOAD MAY MAKE CHANGES TO THE CONFIGURATION, MASS AND STRUCTURAL PROPERTIES OF THE RACK.

Rationale: Any time the configuration of an ARIS rack is changed, the rack configuration must be characterized to determine the ARIS control parameters required to ensure proper isolation performance. This criterion is met if non-ARIS-ICE payloads, or any cables, within the rack are not removed or reconfigured during ARIS rack characterization testing. Changes to the rack configuration may be made after a full set of characterization tests has been completed.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

N12.2-6 ARIS CONSTRAINT ON STOWAGE IN ARIS RACKS

ANY LOOSE ITEMS TO BE STOWED IN AN ARIS-EQUIPPED RACK MUST BE STOWED IN A MIDDECK LOCKER OF DRAWER, PROPERLY MOUNTED IN THE RACK, AND THE STOWED ITEMS MUST BE PACKED IN FOAM SO THAT THEY CANNOT SHIFT POSITION INSIDE THE LOCKER OR DRAWER.

Rationale: The tight packing of stowed items is to ensure that ARIS can provide proper isolation to the rack from station disturbances.

FLIGHT/INCREMENT APPLICABILITY: Generic

N12.2-7 ARIS CONSTRAINTS ON CABLES AND CONNECTORS

CAPS AND CABLES SHOULD BE SECURED WITH VELCRO OR TAPE DURING RACK/PAYLOAD INSTALLATION TO KEEP SUCH ITEMS FROM SHIFTING WHEN ARIS IS IN ACTIVE ISOLATION MODE. LOOSE SECTIONS OF CABLES, INCLUDING LOOPS, MUST BE SECURED TO THE PAYLOAD FACE OR SEAT TRACK. IN ADDITION, CABLES ROUTED AROUND OR NEXT TO ARIS RACKS MUST NOT TOUCH THE ARIS RACK IN ANY WAY.

Rationale: For ARIS to provide proper isolation of the rack from station disturbances, payload dynamics must be 35 Hz or greater and the ARIS rack itself must be free to float in its sway space envelope.

FLIGHT/INCREMENT APPLICABILITY: Generic

N12.2-8 ARIS CONSTRAINT ON CREW INTERACTION

WHEN ARIS IS IN ACTIVE ISOLATION MODE PHYSICAL INTERACTION OR CONTACT WITH THE RACK, EXCEPT AS EXPLICITLY DIRECTED BY ARIS-ICE PROCEDURES, SHOULD BE MINIMIZED. THIS INCLUDES THE USE OF THE EXPRESS LAPTOP COMPUTER CONNECTED TO THE ARIS RACK. ANY CONTACT OR INTERACTION THAT DOES OCCUR SHOULD BE REPORTED TO THE ARIS-ICE TEAM. THE TIME AND NATURE OF THE INTERACTION/CONTACT AND THE REACTION OF THE ARIS RACK SHOULD BE INCLUDED IN THE REPORT.

Rationale: Crew-induced disturbances on the ARIS rack will prevent proper isolation performance.

FLIGHT/INCREMENT APPLICABILITY: Increment 3

PAYLOAD REGULATIONS

SECTION N13 - GROUND SYSTEMS

N13.1-1 AVAILABILITY OF OPERATIONS PRODUCTS

POIC OPERATIONS PRODUCTS WILL BE PROVIDED TO REMOTE USERS VIA PIMS AND THE WORLD WIDE WEB.

Rationale: As a standard service to remote users, operations products will be posted on the POIC World Wide Web site. Remote users are responsible for providing their own World Wide Web capability for accessing the POIC site.

FLIGHT/INCREMENT APPLICABILITY: Generic

N13.1-2 TELESCIENCE SUPPORT CENTER (TSC) SUPPORT SITES

~~PAYLOAD NAME~~	~~TSC SUPPORT SITE~~
~~ADVASC~~	~~UW-Madison, WI*~~
~~ARIS-ICE~~	~~Boeing-Seattle*, JSC* and MSFC-USOC*~~
~~BRP~~	~~ARC+~~
~~CGBA~~	~~UC-Boulder, CO*~~
~~CPCG-H~~	~~UAB, Birmingham, AL**~~
~~EXPPCS~~	~~GRC** and Harvard, Cambridge, MA*~~
~~HRF~~	~~JSC*~~
~~MAMS~~	~~GRC**~~
~~PCG-STES, PCG-BAG~~	~~MSFC*~~
~~SAMS~~	~~GRC**~~

~~* - These sites valid for Increment 2.~~
~~** - These sites valid for Increment 2 and beyond.~~
~~+ - These sites valid for Increment 3.~~

PAYLOAD NAME	TSC SUPPORT SITE
ARIS-ICE	Boeing-Seattle+, JSC+ and MSFC-USOC+
BTR/BSTC	JSC-TSC+
DCPCG	UAB+, Birmingham, AL and MSFC TSC+
EXPRESS	MSFC-USOC+, Univ. of California, San Diego+
EXPPCS	GRC**
HRF	JSC**
MAMS	GRC**
MSG	MSFC(MDL/TSC)++
PEI	Boeing-Houston+
SAMS	GRC**

** - These sites valid for Increment 2 and beyond.
+ - These sites valid for Increment 3.
++ - These sites valid for Increment 4 and beyond.

FLIGHT/INCREMENT APPLICABILITY: As noted above.

N13.1-3 POINT OF OPERATIONAL CONTROL

A PAYLOAD OR FACILITY WILL HAVE A SINGLE POINT OF OPERATIONAL COMMITMENT TO THE POIC AT ALL TIMES.

Rationale: A payload or facility may have its operational capabilities distributed among different physical locations. However, there will always be one and only one of those locations that acts as the point of operational control and commitment to the POIC. That location may change based upon the nature of the operations, but at no time will there be two locations in contention for control. Multiple payload/facility sites should remain coordinated with one another, especially in the creation of, or response to, Operations Change Requests (OCR). The payload or facility will always notify the POIC when a transfer of operational control has occurred.

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

SECTION N14 - OPERATIONS PREPARATION

N14.1-1 EXPRESS RACK INSTALLATION AND CHECKOUT PROCEDURES

THE MCC-H AND THE POIC ARE RESPONSIBLE FOR DEVELOPING THE INSTALLATION AND CHECKOUT PROCEDURES FOR TRANSFERRING EXPRESS RACK(S) FROM A CARRIER AND INSTALLING THEM ON-ORBIT.

FLIGHT/INCREMENT APPLICABILITY: Generic

N14.1-2 EXPRESS PAYLOAD INSTALLATION AND CHECKOUT

THE RESPONSIBILITIES FOR DEVELOPING THE CREW PROCEDURES FOR EXPRESS PAYLOAD INSTALLATION AND CHECKOUT ARE AS FOLLOWS.

A. CONTINUOUS POWERED PAYLOADS

THE POIC IS RESPONSIBLE FOR DEVELOPING THE CREW PROCEDURES FOR TRANSFERRING CONTINUOUS POWERED SUBRACK PAYLOADS FROM THE MIDDECK INTO THE EXPRESS RACK(S). THE POIC IS ALSO RESPONSIBLE FOR DEVELOPING AND INTEGRATING THE INSTALLATION STEPS INTO THIS TRANSFER PROCEDURE. FURTHER, THE POIC IS RESPONSIBLE FOR INTEGRATING THE PAYLOAD-DEVELOPED ACTIVATION/DEACTIVATION PROCEDURES INTO THIS TRANSFER PROCEDURE. THE PAYLOAD USERS ARE RESPONSIBLE FOR DEVELOPING THE ACTIVATION/CHECKOUT AND DEACTIVATION PROCEDURES FOR THE PAYLOAD(S). THE CHECKOUT PROCEDURES ARE NOT PART OF THE TRANSFER PROCEDURE UNLESS THEY ARE NECESSARY FOR ACTIVATION OF THE PAYLOAD TO THE STATE IT WAS IN THE MIDDECK.

B. NON-CONTINUOUS POWERED PAYLOADS

THE MCC-H IS RESPONSIBLE FOR DEVELOPING THE GENERIC CREW PROCEDURES FOR TRANSFERRING NON-CONTINUOUS POWERED SUBRACK PAYLOADS FROM A CARRIER INTO THE EXPRESS RACK(S). THE PAYLOAD USERS ARE RESPONSIBLE FOR DEVELOPING THE CREW PROCEDURES FOR INSTALLING THE PAYLOAD(S) INTO THE RACK AND ACTIVATION/CHECKOUT AND DEACTIVATION OF THE PAYLOAD(S).

Rationale: EXPRESS payload installation consists of power cable mating, data cable mating, and other interfaces required to support payload operations including potable water, VES, and payload applications on the EXPRESS laptop.

PAYLOAD REGULATIONS

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

N14.1-3 BACKUP COMMANDING

USERS SHALL PROVIDE THE POIC WITH THE COMMAND DATA, ASSOCIATED TELEMETRY FOR VERIFYING COMMAND ACCEPTANCE, AND COMMANDING PROCEDURES FOR PERFORMING BACKUP COMMANDING.

Rationale: Users must provide the technical data required to perform backup commanding from the POIC. Backup commanding will be performed in accordance with established agreements for performing backup commanding as documented in the Ground Command Procedures documentation. Backup commanding will be performed by the POIC in accordance with the procedures in the POIC Payload Operations Handbook (POH).

FLIGHT/INCREMENT APPLICABILITY: Generic

N14.1-4 AUTHORITY DELEGATED TO POIC

DURING INCREMENT PREPARATION, PRINCIPAL INVESTIGATORS (PI)/PD WILL IDENTIFY AND DEFINE, IN COORDINATION WITH THE POIC, PROCEDURES AND CONDITIONS UNDER WHICH OPERATION OF THEIR PAYLOAD SHALL DEFAULT TO THE POIC. THESE PROCEDURES AND CONDITIONS SHALL INCLUDE, BUT NOT BE LIMITED TO:

A. AUTHORITY TO SAFE THE PAYLOAD TO PREVENT DAMAGE TO THE PAYLOAD OR LOSS OF SCIENCE INFORMATION. (FLIGHT RULES WILL COVER SAFING ASSOCIATED WITH DAMAGE TO THE STATION OR SAFETY OF THE CREW.)

B. AUTOMATIC LIMIT SENSING CAPABILITIES OF THE PAYLOAD THAT (1) IDENTIFY NON-SAFETY RELATED PAYLOAD CONDITIONS, (2) THAT THE PI/PD CAN MAKE AVAILABLE TO THE POIC, AND (3) THAT REQUIRE AN IMMEDIATE RESPONSE IN THE ABSENCE OF THE PI/PD TEAM.

C.~~C.~~ INCREMENT-SPECIFIC CONDITIONS UNDER WHICH THE PI/PD DELEGATES AUTHORITY TO THE POIC AND WHICH SHALL BE INCLUDED IN INCREMENT-SPECIFIC UPDATES TO THIS DOCUMENT.

SPECIFIC DEKEGATIONS OF AUTHORITY TO THE POIC WILL BE DOCUMENTED IN SECTION 12 OF THIS DOCUMENT. PAYLOADS THAT DO NOT PROVIDE SUCH DESIGNATIONS ACCEPT ANY RISK INHERENT IN NOT DOING SO.

FLIGHT/INCREMENT APPLICABILITY: Generic

N14.1-5 PREFERENCE FOR OPERATIONS PERFORMED BY THE GROUND

ALL PAYLOAD ACTIVITIES THAT CAN BE PERFORMED BY THE GROUND, WILL BE PERFORMED BY THE GROUND.

Rationale: During ISS assembly, crew time is too valuable to be used for activities that can be performed by ground personnel. Also, payload activities scheduled for crew performance may be delayed/deleted due to pressing assembly/systems activities.

FLIGHT/INCREMENT APPLICABILITY: Generic

N14.1-6 COMMAND WINDOW SCHEDULING REQUIREMENTS

ALL PAYLOAD COMMAND WINDOW REQUESTS SHALL BE DEFINED BY SPECIFIC COMMAND REQUIREMENTS. BLANKET, CONSTANT COMMANDING ENABLEMENT WILL NOT BE GRANTED TO ANY PAYLOAD TEAM.

Rationale: During the ISS assembly phase, systems and payload ground commanding will be extensive. Due to the volume of commanding expected and the number of commanding entities, blanket "24x7" commanding windows cannot be granted to individual payloads. This policy may be reassessed at a future date as assembly nears completion and operations become routine. Command windows are assigned based on iURC requirements.

FLIGHT/INCREMENT APPLICABILITY: Generic

PAYLOAD REGULATIONS

SECTION N15 – POST-INCREMENT OPERATIONS

RESERVED

APPENDIX A - ACRONYMS AND ABBREVIATIONS

A	AMPERES
A/G	AIR TO GROUND
ACS	ATMOSPHERIC CONTROL AND SUPPLY
ADVASC	ADVANCED ASTROCULTURE
APID	APPLICATIONS PROCESSING IDENTIFICATION
APCF	ADVANCED PROTEIN CRYSTALLIZATION FACILITY
APS	AUTOMATED PAYLOAD SWITCH
ARC	AMES RESEARCH CENTER
ARIS	ACTIVE RACK ISOLATION SYSTEM
ARIS-ICE	ARIS-ISS CHARACTERIZATION EXPERIMENT
ASCII	AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE
ASI	AGENZIA SPAZIALE ITALIANA (ITALIAN SPACE AGENCY)
BBND	BONNER BALL NEUTRON DETECTOR
BRP	BIOLOGICAL RESEARCH PROJECT
BSTC	BIOTECHNOLOGY SPECIMEN TEMPERATURE CONTROLLER
BTR	BIOTECHNOLOGY REFRIGERATOR
C	CENTIGRADE
C&C	COMMAND AND CONTROL
C&DH	COMMAND AND DATA HANDLING
CDB	COMMAND DATABASE
CGBA	COMMERCIAL GENERIC BIOPROCESSING APPARATUS
CHeCS	CREW HEALTH CARE SYSTEM
CPCG-H	COMMERCIAL PROTEIN CRYSTAL GROWTH – HIGH DENSITY PROTEIN CRYSTAL GROWTH
CVIT	COMMON VIDEO INTERFACE TRANSMITTER
CWC	CONTINGENCY WATER CONTAINER
DCM	DOCUMENT CONFIGURATION MANAGEMENT
DCPCG	DYNAMICALLY CONTROLLED PROTEIN CRYSTAL GROWTH
DOSMAP	DOSIMETRIC MAPPING
DPO	DAILY PAYLOADS OPERATIONS
ECR	ENGINEERING CHANGE REQUEST
EMU	EXPRESS MEMORY UNIT
EOM	END OF MISSION
EVA	EXTRA-VEHICULAR ACTIVITY
EXPRESS	EXPEDITE THE PROCESSING OF EXPERIMENTS TO SPACE STATION
EXPPCS	~~(EXPRESS)~~EXPERIMENT ON PHYSICS OF COLLOIDS IN SPACE ~~EXPERIMENT~~

°F	DEGREES FAHRENHEIT
FD	FLIGHT DAY
GASMAP	GAS ANALYZER SYSTEM FOR METABOLIC ANALYSIS OF PHYSIOLOGY
GN_2	GASEOUS NITROGEN
HRDL	HIGH RATE DATA LINK
HRF	HUMAN RESEARCH FACILITY
IFM/IFMs	IN-FLIGHT MAINTENANCE/IN-FLIGHT MAINTENANCE PROCEDURES
IP	INTERNATIONAL PARTNER
ISIS	INTERNATIONAL SUBRACK INTERFACE STANDARD
ISPR	INTERNATIONAL STANDARD PAYLOAD RACK
ISS	INTERNATIONAL SPACE STATION
iURC	INTERIM USER REQUIREMENTS COLLECTION
JOIP	JOINT OPERATIONS INTERFACE PROCEDURES
JSC	JOHNSON SPACE CENTER
KBS	KILOBITS
KW	KILOWATTS
LAN	LOCAL AREA NETWORK
LBM	POUNDS MASS
LCA	LOAD CONTROL ASSEMBLY
LIS	LEAD INCREMENT SCIENTIST
LNS	LABORATORY NITROGEN SYSTEM
LSE	LABORATORY SUPPORT EQUIPMENT
LTL	LOW TEMPERATURE LOOP
MALS	MALFUNCTION PROCEDURES
MAMS	MICROGRAVITY ACCELERATION MEASUREMENT SYSTEM
MBPS	MEGABITS PER SECOND
MCC-H	MISSION CONTROL CENTER – HOUSTON
MCOR	MEDIUM-RATE COMMUNICATIONS OUTAGE RECORDER
MDL	MIDDECK LOCKER
MDM	MULTIPLEXER/DEMULTIPLEXER
MELFI	MINUS EIGHTY DEGREE LABORATORY FREEZER FOR THE INTERNATIONAL SPACE STATION
MHZ	MEGAHERTZ
MM	MILLIMETER
MOA	MEMORANDUM OF AGREEMENT
MPLM	MINI-PRESSURIZED LOGISTICS MODULE
MSFC	MARSHALL SPACE FLIGHT CENTER

PAYLOAD REGULATIONS

MTL	MODERATE TEMPERATURE LOOP
NASA	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NIV	NITROGEN ISOLATION VALVE
NPOCB	NASA PAYLOAD OPERATIONS CONTROL BOARD
OCR	OPERATIONS CHANGE REQUEST
ODF	OPERATIONS DATA FILE
OSTP	ON-BOARD SHORT-TERM PLAN
PAYCOM	PAYLOAD COMMUNICATIONS MANAGER
PCB	PAYLOAD CONTROL BOARD
PCBA	PORTABLE CLINICAL BLOOD ANALYZER
PCG-STES	PROTEIN CRYSTAL GROWTH – SINGLE LOCKER THERMAL ENCLOSURE SYSTEM
PCS	PORTABLE COMPUTER SYSTEM
PD	PAYLOAD DEVELOPER
PEHG	PAYLOAD ETHERNET HUB/GATEWAY
PI	PRINCIPAL INVESTIGATOR
PIMS	PAYLOAD INFORMATION MANAGEMENT SYSTEM
PLSS	PAYLOAD SUPPORT SYSTEMS
POD	PAYLOAD OPERATIONS DIRECTOR
PODF	PAYLOAD OPERATIONS DATA FILE
POH	PAYLOAD OPERATIONS HANDBOOK
POIC	PAYLOAD OPERATIONS INTEGRATION CENTER
POP	PAYLOAD ON-ORBIT PROCESSOR (ARIS-ICE)
PRO	PAYLOAD RACK OFFICER
PSE	PAYLOAD SUPPORT EQUIPMENT
PUFF	PULMONARY FUNCTION IN FLIGHT (HRF)
RED	RESISTIVE EXERCISE DEVICE
RFCA	RACK FLOW CONTROL ASSEMBLY
RIC	RACK INTERFACE CONTROLLER
RIV	RACK ISOLATION VALVE
RPC	REMOTE POWER CONTROLLER
RPCM	REMOTE POWER CONTROL MODULE
RSA	RUSSIAN SPACE AGENCY
SAMS	SPACE ACCELERATION MEASUREMENT SYSTEM
S/G	STATION TO GROUND
SLAMMD	SPACE LINEAR ACCELERATION MASS MEASUREMENT DEVICE
SPDA	SECONDARY POWER DISTRIBUTION ASSEMBLY
SSE	STATION SUPPORT EQUIPMENT
SSPC	SOLID STATE POWER CONTROLLER
SSPCM	SOLID STATE POWER CONTROL MODULE
STP	SHORT-TERM PLAN

TBD	TO BE DETERMINED
TDB	TELEMETRY DATABASE
TSC	TELESCIENCE SUPPORT CENTER
UF	UTILIZATION FLIGHT
UIL	USER/UTILITY INTERFACE LANGUAGE
USOS	UNITED STATES ON-ORBIT SEGMENT
V	VOLTS
VES	VACUUM EXHAUST SYSTEM
VRS	VACUUM RESOURCE SYSTEM
VSU	VIDEO SWITCHING UNIT
W	WATTS

PAYLOAD REGULATIONS

APPENDIX B - CHANGE CONTROL

PRE-INCREMENT

This document is subject to the NASA Payload Operations Control Board (NPOCB) change control process as identified in the Charter and Operations Policy which are located on the Web. The Engineering Change Request (ECR) form (MSFC form 2327) can be found on the Configuration Management Web site. ECR submitters shall send a copy of the ECR to the NASA Payload Regulations book manager prior to submitting it to their respective Control Board Representative.

INCREMENT OPERATIONS

Changes requested during increment operations shall be submitted by an Operations Change Request (OCR) in accordance with the Payload Operations Handbook (POH). An ECR will be submitted for those changes, made by OCR, that are found to be valid for inclusion in future pre-increment deliveries of the document. Once the OCR change has been transferred to an ECR the process proceeds as written in the pre-increment process above.

PAYLOAD REGULATIONS

APPENDIX C - REFERENCE DOCUMENTS

Automated Payload Switch Operations Scenario

End-to-End Commanding Operations Manual

EXPRESS Rack Operations Manual

High Rate Frame Multiplexer Operations Scenario

Memorandum of Agreement Among CHeCS Project, Human Research Facility Project, Biological Research Project, Astronaut Office, ISS Vehicle Office, and ISS Payloads Office For Sharing Equipment on ISS

Multilateral Payload Regulations

On-board Short-Term Plan Operations Manual

Operations Data File Procedures Standards, SSP 50253

Operations Nomenclature, SSP 50254

Payload Ethernet Hub Gateway Operations Scenario

Payload File Transfer Operations Manual

Payload Support Systems Operations Manual

Portable Computer System Operations Manual

SCU Operations Scenario

Software Specifications Requirements Document, MSFC-STD-1274

Team Definition Document

U.S. Payload Operations Data File Management Plan, SSP 58700

Video Baseband Signal Processor Operations Scenario

Video Switch Unit Operations Scenario

Video Tape Recorder Operations Scenario

PAYLOAD REGULATIONS

APPENDIX D - POINTS OF CONTACT

POINTS OF CONTACT FOR DOCUMENT DEVELOPMENT

SECTION	PERSON/ TEAM RESPONSIBLE	DESIGNATED POINT OF CONTACT	PHONE NO./E-MAIL
1. INTRODUCTION	POIF POD Barbara Cobb	Barbara Cobb	(256) 544-2190 barbara.cobb@msfc.nasa.gov
2. AUTHORITY & RESPONSIBILITY	POIF POD Tina Melton	Tina Melton	(256) 544-2190 barbara.cobb@msfc.nasa.gov
3. PAYLOAD OPERATIONS	POIF/OC J. Wrape	J. Wrape	(256) 544-5624 jim.wrape@msfc.nasa.gov
4. AUTOMATED PROCEDURES	POIF/OC J. Wrape	Ray Shaughnessy	(256) 544-6969 ray.shaughnessy@msfc.nasa.gov
5. CREW PROCEDURES	POIF Barbara Brazelton	Barbara Brazelton	(256) 961-1005 barbara.brazelton@pobox.tbe.com
6. COMMAND & DATA HANDLING	POIF/DM Gary Knickerbocker	Gary Knickerbocker	(256) 961-1513 gary.knickerbocker@tbe.com
7. COMMUNICATIONS & TRACKING	POIF/DM Gary Knickerbocker	Gary Knickerbocker	(256) 961-1513 gary.knickerbocker@tbe.com
8. RESOURCE MANAGEMENT	POIF/MP Karla Kochevar	Karla Kochevar	(256) 544-2233 karla.kochevar@msfc.nasa.gov
9. PAYLOAD SUPPORT SYSTEMS	POIF/OC J. Wrape	Richard Weaver	(256) 961-2004 richard.weaver@tbe.com
10. LABORATORY SUPPORT EQUIPMENT	POIF/OC J. Wrape	Richard Weaver	(256) 961-2004 richard.weaver@tbe.com
11. EXPRESS	POIF/OC J. Wrape	Richard Weaver	(256) 961-2004 richard.weaver@tbe.com
12. PAYLOAD UNIQUE	POIF/OC J. Wrape	J. Wrape	(256) 544-5624 jim.wrape@msfc.nasa.gov
13. GROUND SYSTEMS	POIF/DM Olander Myers	Olander Myers	(256) 544-5505 olander.myers@msfc.nasa.gov
14. OPERATIONS PREPARATION	POIF/POD Carrie Olsen	Carrie Olsen	(256) 544-2271 carrie.olsen@msfc.nasa.gov
15. POST INCREMENT OPERATIONS	POIF/POD Carrie Olsen	Carrie Olsen	(256) 544-2271 carrie.olsen@msfc.nasa.gov
A. ACRONYMS	POIF/POD Carrie Olsen	Carrie Olsen	(256) 544-2271 carrie.olsen@msfc.nasa.gov
B. CHANGE CONTROL	POIF/POD Carrie Olsen	Carrie Olsen	(256) 544-2271 carrie.olsen@msfc.nasa.gov

C. REFERENCE DOCUMENTS	POIF/POD Carrie Olsen	Carrie Olsen	(256) 544-2271 carrie.olsen@msfc.nasa.gov
D. POINTS OF CONTACT	POIF/POD Carrie Olsen	Carrie Olsen	(256) 544-2271 carrie.olsen@msfc.nasa.gov

PAYLOAD REGULATIONS

APPENDIX E – OPEN TBRs/TBDs

RESOLUTION	BRIEF DESCRIPTION	RESPONSIBILITY	DUE DATE
N4.1-2	Max. size (kilobits) of automated procedures is undefined as there are currently no automated procedures. This will be addressed when needed.	FD32/Carrie Olsen	Unknown
~~**N?.?**~~ ~~**(This could be added to N14.1-4)**~~	~~New regulation needed that documents that PDs who have declined to submit "power of attorney" regulations for the POIC to do certain commanding in their stead, are thereby accepting the risk implied.~~	~~FD32/Barbara Cobb and Carrie Olsen~~	~~2/21/2001~~
N?.?	New regulation needed to assert lack of back-up capabilities provided by ISS Program for TSCs if comm, etc is lost	FD32/Barbara Cobb and Carrie Olsen	2/21/2001
N?.?	Need regulations to cover the proper handling of vertebrate animals.	FD32/Carrie Olsen	7/05/2001
N?.?	Need regulation about use of HOSC recorder to record data during rack/payload activations and other critical operations.	FD32/Geoff Lochmaier	2/21/2001

APPENDIX F – CREW TRAINING MATRIX

Note: For Increment 3 ECR Review see the crew training matrix in separate attachment included with the ECR. The following pages contain the Increment 2 Crew Training Matrix. This one will be replaced with the Increment 3 matrix.

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
HRF:						
CSWR					**No**	
MGUEHRFCSWRN001	SETUP HRF PC USING RACK POWER	**B**	**P**	**U**		
MGUEHRFCSWRN002	HRF COMMON SOFTWARE CHECKOUT	**B**	**P**	**U**		
MGUEHRFCSWRN003	HRF COMMON SOFTWARE NOMINAL OPERATIONS	**B**	**P**	**U**		
MGUEHRFCSWRN004	LOG OFF HRF PC	**B**	**P**	**U**		
MGUEHRFCSWRN005	SHUT DOWN HRF PC	**B**	**P**	**U**		
MGUEHRFCSWRN006	SETUP HRF PC WITH ETHERNET CONNECTION	**B**	**P**	**U**		
MGUEHRFCSWRN007	SETUP HRF PC WITH RS-232	**B**	**P**	**U**		
MGUEHRFCSWRN008	SETUP HRF PC WITH RS-422	**B**	**P**	**U**		
MGUEHRFCSWRN009	SETUP HRF PC USING UOP POWER	**B**	**P**	**U**		
MGUEHRFCSWRN010	DISCONNECT HRF PC FROM UOP	**B**	**P**	**U**		
MGUEHRFCSWRN011	DISCONNECT HRF PC FROM HRF RACK	**B**	**P**	**U**		
MGUEHRFCSWRC001	COMMON SOFTWARE DOWNLINK OPERATIONS	**B**	**P**	**U**		
MGUEHRFCSWRC002	RESTORE CONNECTION	**B**	**P**	**U**		
Workstation					**Yes**	
MGUEHRFWORKN001	Workstation In-Flight System Functional Test	**P**	**P**	**U**		
MGUEHRFWORKN002	Workstation Nominal Setup	**P**	**P**	**U**		
Rack					**No**	
MGUEHRFRACKN001	HRF Rack Activation	**B**	**P**	**U**		
MGUEHRFRACKN002	HRF Rack Checkout	**B**	**P**	**U**		
MGUEHRFRACKN003	HRF Rack Deactivation	**B**	**P**	**U**		
GASMAP					**Yes**	
MGUEHRFGASMC001	GASMAP Auto Calibration	**U**	**P**	**U**		
MGUEHRFGASMC008	GASMAP Roughing Operations	**U**	**P**	**U**		
MGUEHRFGASMC009	GASMAP Filter and Catheter Change Out	**U**	**P**	**U**		
MGUEHRFGASMM001	GASMAP Flow Rate Out Of Range	**U**	**P**	**U**		

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
MGUEHRFGASMM002	GASMAP Error Light On	U	P	U		
MGUEHRFGASMM003	GASMAP SERVER DIAGNOSTIC	U	P	U		
MGUEHRFGASMN001	GASMAP 90-Day Health Check	U	P	U		
MGUEHRFGASMN002	GASMAP 30-Day Health Check	U	P	U		
MGUEHRFGASMN003	GASMAP Configuration for HRF Rack	U	P	U		
ULTRASOUND					Yes	
MGUEHRFUSNDC001	Ultrasound Operations For Using A Fake Scanhead	U	P	U		
M2UEHRFUSNDC003	Ultrasound Operations For Image Collector Software	U	P	U		
M2UEHRFUSNDC002	Ultrasound Operations For Diagnostics Software	U	P	U		
MGUEHRFUSNDN001	ULTRASOUND Functional Test 1	U	P	U		
MGUEHRFUSNDN002	ULTRASOUND Functional Test 2	U	P	U		
MGUEHRFUSNDN003	Physiological System Evaluation By ULTRASOUND	U	P	U		
MGUEHRFUSNDR001	ULTRASOUND Tower Test Image Fidelity Verification	U	P	U		
BBND					Yes	
MGUEHRFBBNDM001	BONNER BALL NEUTRON DETECTOR Lights Out	P	U	U		
MGUEHRFBBNDM002	BBND Malfunction Table	P	U	U		
MGUEHRFBBNDN001	BONNER BALL NEUTRON DETECTOR Operations	P	U	U		
MGUEHRFBBNDN002	BONNER BALL NEUTRON DETECTOR Maintenance	P	U	U		
MGUEHRFBBNDN003	BONNER BALL NEUTRON DETECTOR Hard Drive Stow	P	U	U		
MGUEHRFBBNDN004	BBND Power Off and Stow	P	U	U		
MGUEHRFBBNDN005	BONNER BALL NEUTRON DETECTOR Status Check	P	U	U		
MGUEHRFBBNDN006	BONNER BALL NEUTRON DETECTOR Relocate	P	U	U		
MGUEHRFBBNDR001	Accessory Hardware Placement	P	U	U		
MGUEHRFBBNDR002	BBND Installation	P	U	U		
MGUEHRFBBNDR003	BBND Hard Drive Installation	P	U	U		
DOSMAP					Yes	
M2GULPDSM004	ERR_CARD' Message On Display	P	U	U		
M2GULPDSM007	WRN FBNN' Message On Display	P	U	U		

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
M2GULPDSNOO8	TLD Reader Clock Changeout	P	U	U		
M2UEHRFDOSMM001	Broken Glass detected From On Orbit Glass Inspection	P	U	U		
MGUEHRFDOSMC001	Setting Real Time Clock on TLD Reader To Onboard Time	P	U	U		
MGUEHRFDOSMC002	Set Period Of TLD Automatic Readout	P	U	U		
MGUEHRFDOSMC003	Set Date Of TLD Automatic Readout	P	U	U		
MGUEHRFDOSMC004	Set Time Of TLD Automatic Readout	P	U	U		
MGUEHRFDOSMN001	DOSMAP Setup and Activation Part 1	P	U	U		
MGUEHRFDOSMN002	DOSTEL Data Download	P	U	U		
MGUEHRFDOSMN003	DOSTEL Mode Change	P	U	U		
MGUEHRFDOSMN004	DOSMAP Setup and Activation Part 2	P	U	U		
MGUEHRFDOSMN005	TLD Manual Read-Outs	P	U	U		
MGUEHRFDOSMN006	TLD Download	P	U	U		
MGUEHRFDOSMN007	MDU Recharging and CIU Data Download	P	U	U		
MGUEHRFDOSMN008	DOSMAP Experiment Deactivation	P	U	U		
MGUEHRFDOSMN009	On Orbit Glass Inspection	P	U	U		
MGUEHRFDOSMN010	Table 1 Dosimeter Placement	P	U	U		
TORSO					**Yes**	
M2UEHRFTORSM001	TORSO LED INDICATOR ANOMALY	P	U	U		
M2UEHRFTORSN001	TORSO SETUP PART 1	P	U	U		
M2UEHRFTORSN002	TORSO SETUP AND ACTIVATE PART 2	P	U	U		
INTERACTIONS					**Yes**	
MGUEHRFNTXNA001	HRF Interactions Experiment Operations Using Workstation	P	P	N		
MGUEHRFNTXNA002	HRF Interactions Backup Procedure Using Workstation	P	P	N		
MGUEHRFNTXNN001	Interactions Experiment Operations	P	P	N		
MGUEHRFNTXNN002	HRF Interactions Backup Procedure Using HRF PC	P	P	N		
H-REFLEX					**Yes**	

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
MGUEHRFHREFC001	H-REFLEX CORRECTIVE FOR HRTU LOW BATTERY LIGHT	P	P	N		
MGUEHRFHREFC002	H-REFLEX CORRECTIVE FOR UNACCEPTABLE DATA	P	P	N		
MGUEHRFHREFN001	Effects Of Altered Gravity On Spinal Cord Excitability (ISS)	P	P	N		
CGBA					**No**	
MGUEEXPRSCGBAN001	CGBA Status Check	P	P	U		
MGUEEXPRSCGBAA005	CGBA Activation	P	U	U		
MGUEEXPRSCGBAA006	CGBA Deactivation	P	U	U		
MGUEEXPRSCGBAN004	CGBA Maintenance	P	U	U		
MGUEEXPRSCGBAA001	CGBA Adjust Set Temp	P	U	U		
MGUEEXPRSCGBAA002	CGBA Adjust EET	P	U	U		
MGUEEXPRSCGBAA003	CGBA Adjust EOM	P	U	U		
MGUEEXPRSCGBAA004	CGBA Set GMT	P	U	U		
MGUEXPRSCGBAM001	CGBA Incorrect TEMP	P	U	U		
MGUEEXPRSCGBAM002	CGBA Incorrect (No) Display	P	U	U		
EXPRESS					**No**	
M2UEEXPRSN001	EXPRESS P/L Resource Configuration Rack #1 (Increment 2	B	P	U		
M2UEEXPRSN002	EXPRESS P/L Resource Configuration Rack #2 (Increment 2)	B	P	U		
M2UEEXPRSN003	EXPRESS P/L Resource Configuration Rack #1 (Increment 2, 7A)	B	P	U		
M2UEEXPRSN004	EXPRESS Rack #2 Umbilical Changeout Power Up	B	P	U		
M2UEEXPRSN005	EXPRESS Rack #2 Umbilical Changeout Power Down	B	P	U		
M2UEEXPRSC001	EXPRESS Rack #1 Configuration After Main To Auxilary Power Switch	B	P	U		
M2UEEXPRSC002	EXPRESS Rack #2 Configuration After Main To Auxilary Power Switch	B	P	U		
MGUEEXPRSN001	Rack Activation/Checkout	B	P	U		

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
MGUEEXPRSN008	Rack Deactivation	B	P	U		
MGUEEXPRSN010	Express Rack Power Up	B	P	U		
MGUEEXPRSN011	Express Rack Power Down	B	P	U		
MGUEEXPRSA001	Individual Water Valve Adjustment	B	P	U		
MGUEEXPRSA002	EXPRESS Laptop Computer (ELC) To ELC File Transfer	B	P	U		
MGUEEXPRSA003	EXPRESS Laptop Computer (ELC) To Express Memory Unit (EMU) File Transfer	B	P	U		
MGUEEXPRSA004	EXPRESS Laptop Computer (ELC) To Trash File Transfer	B	P	U		
MGUEEXPRSA005	EXPRESS Memory Unit (EMU) To EXPRESS Laptop Computer (ELC)	B	P	U		
MGUEEXPRSA006	EXPRESS Memory Unit (EMU) To Payload Executive Processor (PEP) File Transfer	B	P	U		
MGUEEXPRSA007	EXPRESS Memory Unit (EMU) To Rack Interface Controller (RIC) File Transfer	B	P	U		
MGUEEXPRSA008	EXPRESS Memory Unit (EMU) To Ground File Transfer	B	P	U		
MGUEEXPRSA009	EXPRESS Memory Unit (EMU) To Trash File Transfer	B	P	U		
MGUEEXPRSA010	Payload Executive Processor (PEP) To Express Memory Unit (EMU) File Transfer	B	P	U		
MGUEEXPRSA011	Thermal Control Enabled	B	P	U		
MGUEEXPRSA012	Select Temperature Sensor For Thermal Control	B	P	U		
MGUEEXPRSA013	Select Flow Sensor For Thermal Control	B	P	U		
MGUEEXPRSA014	Change Thermal Control Sensor Limit	B	P	U		
MGUEEXPRSA015	AAA Fan Speed Adjustment	B	P	U		
MGUEEXPRSA016	SSPCM Actual Condition Modification	B	P	U		
MGUEEXPRSA017	Payload Configuration Parameter Modification	B	P	U		
MGUEEXPRSA018	Payload Discrete Modification	B	P	U		
MGUEEXPRSA019	Payload Ancillary Data Modification	B	P	U		
MGUEEXPRSA020	Payload Telemetry Modification	B	P	U		

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
MGUEEXPRSA021	Rack Telemetry Control Modification	B	P	U		
MGUEEXPRSA022	Rack Port Control Modification	B	P	U		
MGUEEXPRSA023	Rack Lan Cam Configuration Modification	B	P	U		
MGUEEXPRSA024	Rack Telemetry Configuration Modification	B	P	U		
MGUEEXPRSA025	Rack Configuration Modification	B	P	U		
MGUEEXPRSA026	SSPCM Initial Configuration Modification	B	P	U		
MGUEEXPRSA027	SSPCM Watchdog Timer	B	P	U		
MGUEEXPRSA028	SSPCM CPU Select	B	P	U		
MGUEEXPRSA029	Water Valve Adjustment By Case	B	P	U		
MGUEEXPRSA030	Thermal Control Disabled	B	P	U		
MGUEEXPRSA031	Change EXPRESS Memory Unit (EMU) Drive	B	P	U		
MGUEEXPRSC001	Payload Data/Power Cable Reconfiguration	B	P	U		
MGUEEXPRSC002	Reconfigure EXPRESS Rack Laptop To RS-232 From Ethernet	B	P	U		
MGUEEXPRSC003	Replace Failed RIC	B	P	U		
MGUEEXPRSC004	Replace Failed AAA	B	P	U		
MGUEEXPRSC005	Replace Failed SAMS EE	B	P	U		
MGUEEXPRSC006	Replace Failed SSPCM	B	P	U		
MGUEEXPRSC007	Replace Failed PEHB	B	P	U		
MGUEEXPRSC008	Replace Failed EMU	B	P	U		
MGUEEXPRSC009	Replace And Configure EXPRESS Laptop Computer (ELC)	B	P	U		
MGUEEXPRSC010	Replace Failed Lamp	B	P	U		
MGUEEXPRSC011	Reset Tripped SSPCM Channel	B	P	U		
MGUEEXPRSC012	Manual Reboot Of RIC	B	P	U		
MGUEEXPRSC013	Replace Failed ASD	B	P	U		
MGUEEXPRSC014	Install/ Remove Vent Closeout Panels	B	P	U		
MGUEEXPRSQ001	Emergency Rack Shutdown	B	P	U		
MGUEEXPRSM001	EXPRESS Rack Application Fails To Load Or Locks Up	B	P	U		

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
MGUEEXPRSM002	ELC Fails To Communicate With RIC	B	P	U		
PCG-STES					**No**	
MGUEEXPRSSTESM001	STES LCD Blank	**U	*	U		See notes at bottom of matrix
MGUEEXPRSSTESM002	STES Pushbutton Lights Blinking	**U	*	U		See notes at bottom of matrix
MGUEEXPRSSTESM003	STES LCD Flashing	**U	*	U		See notes at bottom of matrix
MGUEEXPRSSTESA001	STES Reset	**U	P	U		See notes at bottom of matrix
MGUEEXPRSSTESA002	STES Thermistor Reconfiguration	**U	P	U		See notes at bottom of matrix
MGUEEXPRSSTESA003	STES Power Cycle	**U	P	U		See notes at bottom of matrix
MGUEEXPRSSTESA004	Reset STES CMD_TEMP	**U	P	U		See notes at bottom of matrix
MGUEEXPRSSTESA005	PCG STES Activation (Pwr Up)	**U	P	U		See notes at bottom of matrix
MGUEEXPRSSTESA006	PCG STES Deactivation (Pwr Down)	**U	P	U		See notes at bottom of matrix
MGUEEXPRSSTESN001	PCG STES VDA-2 Activation	**U	P	U		See notes at bottom of matrix
MGUEEXPRSSTESN003	PCG STES VDA-2 Deactivation	**U	P	U		See notes at bottom of matrix
MGUEEXPRSSTESN004	PCG STES PCAM Activation	**U	P	U		See notes at bottom of matrix
MGUEEXPRSSTESN005	PCG STES PCAM Deactivation	**U	P	U		See notes at bottom of matrix
ARIS					**YES**	**OBT for ORU replacement only**
MGUEEXPRSARISN001	ARIS Activation	P	B	U		
MGUEEXPRSARISN002	Pushrod Calibration	P	B	U		
MGUEEXPRSARISN003	ARIS Operations	P	B	U		

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
MGUEEXPRSARISN004	ARIS Monitoring	P	B	U		
MGUEEXPRSARISN005	ARIS Deactivation	P	B	U		
MGUEEXPRSARISN006	Install Snubber Alignment Guides	P	B	U		
MGUEEXPRSARISN007	Remove Snubber Alignment Guides	P	B	U		
MGUEEXPRSARISN010	Install Retractors	P	B	U		
MGUEEXPRSARISN011	Remove Retractors	P	B	U		
MGUEEXPRSARISN012	Install Microgravity Rack Barrier	P	U	U		Done in ARIS ICE Session
MGUEEXPRSARISN013	Remove Microgravity Rack Barrier	P	U	U		Done in ARIS ICE Session
MGUEEXPRSARISC001	Controller Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC002	Actuator Driver Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC003	Remote Electronic Unit (A3) Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC004	Remote Electronic Unit (A4) Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC005	Remote Electronic Unit (A5) Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC006	Accelerometer (A6) Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC007	Accelerometer (A7) Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC008	Accelerometer (A8) Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC009	Lower Pushrod/Actuator Assembly (A9) Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC010	Lower Pushrod/Actuator Assembly(A10)Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC011	Lower Pushrod/Actuator Assembly(A11)Replacement	P***	B***	U		See note at bottom of matrix.

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
MGUEEXPRSARISC012	Lower Pushrod/Actuator Assembly(A12)Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC013	Upper Pushrod/Actuator Assembly(A13)Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC014	Upper Pushrod/Actuator Assembly(A14)Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC015	Lower Pushrod/Actuator Assembly(A15)Replacement	P***	B***	U		See note at bottom of matrix.
MGUEEXPRSARISC016	Lower Pushrod/Actuator Assembly(A16)Replacement	P***	B***	U		See note at bottom of matrix.
ADVASC					**No**	
MGUEEXPRSASCN001	ADVASC Cable Connections	P	U	U		
MGUEEXPRSASCN002	ADVASC Activation	P	U	U		
MGUEEXPRSASCN003	ADVASC Status Monitoring	P	P	U		
MGUEEXPRSASCN004	ADVASC Gas Sample	P	U	U		
MGUEEXPRSASCN005	ADVASC Condensate Fluid Sample	P	U	U		
MGUEEXPRSASCN006	ADVASC Nutrient Fluid Exchange	P	U	U		
MGUEEXPRSASCN007	ADVASC End Experiment	P	U	U		
MGUEEXPRSASCN008	ADVASC Deactivation	P	U	U		
MGUEEXPRSASCN009	ADVASC Cable Disconnections	P	U	U		
MGUEEXPRSASCN010	ADVASC Nutrient Fluid Sample	P	U	U		
MGUEEXPRSASCM001	ADVASC Data Download	P	U	U		
MGUEEXPRSASCM002	ADVASC Power Cycle	P	U	U		
MGUEEXPRSASCC001	ADVASC Filter Cleaning	P	U	U		
MGUEEXPRSASCC002	ADVASC Clock Adjustment	P	U	U		
MGUEEXPRSASCC003	ADVASC Change Set Points	P	U	U		
MGUEEXPRSASCC004	ADVASC Experiment Resumption	P	U	U		
CPCG					**No**	
MGUEEXPRSCPCGN001	CPCG-H Activation	U	P	U		
MGUEEXPRSCPCGN002	CPCG-H Deactivation	U	P	U		
MGUEEXPRSCPCGN003	CPCG-H Status Check	P	P	B****		

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
MGUEEXPRSCPCGA001	CRIM-M Reset (ISS)	U	P	B****		
MGUEEXPRSCPCGA002	CRIM-M Thermistor Reconfiguration (ISS)	U	P	B****		
MGUEEXPRSCPCGA003	CRIM-M Power Cycle (ISS)	U	P	B****		
MGUEEXPRSCPCGA004	CRIM-M Command Temp Reset (ISS)	U	P	B****		
MGUEEXPRSCPCGM001	CRIM-M Message Status (ISS)	U	P	B****		
MGUEEXPRSCPCGM002	CRIM-M LCD Blank (ISS)	U	P	B****		
MGUEEXPRSCPCGM003	CRIM-M On Battery Power (ISS)	U	P	B****		
SAMS II					**No**	Helms received the Overview Training
MGUEEXPRSSAMSN001	Interim Control Unit Drawer Setup	P	A	U		
MGUEEXPRSSAMSN002	RTS Drawer Setup For Two External Sensors	P	A	U		
MGUEEXPRSSAMSN003	RTS Drawer Setup For Two Internal Sensors	P	A	U		
MGUEEXPRSSAMSN004	RTS Drawer Setup For One External And One Internal Sensor	P	A	U		
MGUEEXPRSSAMSN005	Interim Control Unit Drawer Activation	P	A	U		
MGUEEXPRSSAMSN006	Remote Triaxial System Drawer Activation	P	A	U		Minimal additional coord needed
MGUEEXPRSSAMSN007	Interim Control Unit Drawer Deactivation	P	A	U		
MGUEEXPRSSAMSN008	Remote Triaxial System Drawer Deactivation	P	A	U		Minimal additional coord needed
MGUEEXPRSSAMSN009	Mounting a Stowed Sensor in an ARIS EXPRESS Rack	P	A	U		
MGUEEXPRSSAMSN010	Removing a Sensor in an ARIS EXPRESS Rack	P	A	U		
MGUEEXPRSSAMSN011	Cleaning ICU Drawer Screens	P	A	U		Minimal additional coord needed
MGUEEXPRSSAMSN012	Cleaning RTS Drawer Screens	P	A	U		Minimal additional coord needed
MGUEEXPRSSAMSN013	ICU Drawer Relocation	P	A	U		
MGUEEXPRSSAMSN014	RTS Drawer Relocation	P	A	U		
MGUEEXPRSSAMSN015	Initial RTS Drawer Setup	P	A	U		
MGUEEXPRSSAMSA001	Communication Checkout	P	A	U		

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
MGUEEXPRSSAMSA002	Status Check	P	A	U		
MGUEEXPRSSAMSA003	System Operations	P	A	U		
MGUEEXPRSSAMSA004	System Maintenance	?	?	?		Procedure withdrawn for I2
MGUEEXPRSSAMSA005	SE Data Acquisition	P	A	U		
MGUEEXPRSSAMSC001	Hard Drive Replacement	P	A	U		
MGUEEXPRSSAMSC002	Laptop Replacement	P	A	U		
MGUEEXPRSSAMSC003	PCB Replacement	P	A	U		
MGUEEXPRSSAMSC004	Temperature Sensor Replacement	P	A	U		
MGUEEXPRSSAMSC005	Fan Replacement in ICU/D	P	A	U		
MGUEEXPRSSAMSC006	Fan Replacement in RTS/D	P	A	U		
MGUEEXPRSSAMSM001	DWR PWR Switch Tripped at RTS/D Activation	P	A	U		
MGUEEXPRSSAMSM002	No Power Light at RTS/D Activation	P	A	U		
MGUEEXPRSSAMSM003	Power Switch Tripped at ICU/D Activation	P	A	U		
MGUEEXPRSSAMSM004	No Power Light at ICU/D Activation	P	A	U		
GGUEEXPRSSAMSQ001	Quick Response Deactivation	?	?	?		
MGUEEXPRSSAMSQ001	Quick Response ICU/D Deactivation	P	A	U		Minimal additional coord needed
MGUEEXPRSSAMSQ002	Quick Response RTS/D Deactivation	P	A	U		Minimal additional coord needed
ARIS ICE					**No**	
M2UEEXPRSICEA001	Set New Shaker Frequency and Amplitude	P	U	U		
M2UEEXPRSICEA002	SAMS II Lower Fitting Removal	P	U	U		
M2UEEXPRSICEA003	SAMS II Upper Fitting Assembly Removal	P	U	U		
M2UEEXPRSICEA004	SAMS II Cables Removal	P	U	U		
M2UEEXPRSICEA005	SAMS II Cables Installation	P	U	U		
M2UEEXPRSICEN001	SAMS II Lower Fitting Installation	P	U	U		
M2UEEXPRSICEN002	SAMS II Upper Fitting Installation	P	U	U		
M2UEEXPRSICEN003	Station Shake Installation	P	U	U		
M2UEEXPRSICEN004	Setup for Reduced Sway Space	P	U	U		

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
M2UEEXPRSICEN005	POP Integration	P	U	U		
M2UEEXPRSICEN006	Reconfigure for POP Control	P	U	U		
M2UEEXPRSICEN007	Rack Shake Installation	P	U	U		
M2UEEXPRSICEN008	Shaker Reorientation	P	U	U		
M2UEEXPRSICEN009	Setup for Full Sway Space	P	U	U		
M2UEEXPRSICEN010	Alternate Umbilical Installation	P	U	U		
M2UEEXPRSICEN011	Hammer Test	P	U	U		
M2UEEXPRSICEN012	Set Frequency Sweep	P	U	U		
M2UEEXPRSICEN013	Pushoff Test with Full Sway Space and Microgravity Rack Barrier Installed	P	U	U		
M2UEEXPRSICEN014	Pushoff Test with Reduced Sway Space and Microgravity Rack Barrier Installed	P	U	U		
M2UEEXPRSICEN015	Pushoff Test with Full Sway Space and Microgravity Rack Barrier Not Installed	P	U	U		
M2UEEXPRSICEN016	POP Activation	P	U	U		
M2UEEXPRSICEN017	Pushoff Test with Reduced Sway Space and Microgravity Rack Barrier Not Installed	P	U	U		
M2UEEXPRSICEN018	ARIS Shaker and ARIS Shaker Controller Deactivation	P	U	U		
M2UEEXPRSICEN019	ARIS Shaker and ARIS Shaker Controller Activation	P	U	U		
M2UEEXPRSICEN021	ICE Final Stow	P	U	U		
M2UEEXPRSICEN022	POP Deactivation	P	U	U		
M2UEEXPRSICEN026	Install Laptop on Adjacent Rack	P	U	U		
M2UEEXPRSICEN027	Rack Shake Move	P	U	U		
M2UEEXPRSICEN028	Stow ARIS Shaker and ARIS Shaker Controller	P	U	U		
M2UEEXPRSICEN029	Disconnect Laptop Cables	P	U	U		
M2UEEXPRSICEN030	Reconnect Laptop Cables	P	U	U		
M2UEEXPRSICEN031	Laptop Test	P	U	U		
M2UEEXPRSICEN032	Setup for Standard Control	P	U	U		
M2UEEXPRSICEN033	Snubber Cup Containment Test	P	U	U		
M2UEEXPRSICEN035	Relocate Laptop to LAB1O1	P	U	U		

PAYLOAD	PROCEDURE NAME	VOSS	HELMS	USACHEV	OBT AVAILABLE	NOTES
MGUEEXPRSARISN012	Install Microgravity Rack Barrier	**P**	**U**	**U**		
MGUEEXPRSARISN013	Remove Microgravity Rack Barrier	**P**	**U**	**U**		
MGUEEXPRSICEN038	ARIS ICE SAMS II SE Installation and Cable Routing	**P**	**U**	**U**		
EXPPCS					**No**	
MGUEEXPRSPCSN001	EXPPCS Test Section Installation	**U**	**P**	**U**		
MGUEEXPRSPCSN002	EXPPCS Coolant Hose, Cable, HD Installation	**U**	**P**	**U**		
MGUEEXPRSPCSN003	EXPPCS Activation	**U**	**P**	**U**		
MGUEEXPRSPCSN004	EXPPCS Final Deactivation	**U**	**P**	**U**		
MGUEEXPRSPCSN005	EXPPCS HD Changeout	**U**	**P**	**U**		
MGUEEXPRSPCSN006	EXPPCS Filter Maintenance	**U**	**P**	**U**		
MGUEEXPRSPCSN007	EXPPCS Removal	**U**	**P**	**U**		
MGUEEXPRSPCSN008	EXPPCS Acoustic Closeout Cover Installation	**U**	**P**	**U**		
MGUEEXPRSPCSN009	EXPPCS Acoustic Closeout Cover Removal	**U**	**P**	**U**		
MGUEEXPRSPCSA001	EXPPCS Manual Commanding	**U**	**P**	**U**		
MGUEEXPRSPCSA002	EXPPCS Communication Path Selection	**U**	**P**	**U**		
MGUEEXPRSPCSA003	EXPPCS Alternate Filter Maintenance	**U**	**P**	**U**		
MGUEEXPRSPCSM001	EXPPCS Software Malfunctions	**U**	**P**	**U**		
MGUEEXPRSPCSM002	EXPPCS Hardware Malfunctions	**U**	**P**	**U**		
PERS		**P**	**P**	**A**	**YES**	**Refresher OBT**

LEGEND

P - Prime - Trained on all payload objectives and may perform these activities.

B - Backup - Trained on all payload objectives, may perform activity if necessary.

U - Untrained - (Not trained. Could train under extenuating circurstances after coordination w/PD and completion of Just in time training and/or guidance from the GSP).

N - Has not met preflight requirements to be allowed to perform activities (BDC, Informed consent, critical skills).

A - Additional coordination/training necessary before activity may be performed.

* Note: Depending on whether the STES team member can make it to the TSC and execute the mal from the ground within time constraints, it will be executed either by the STES team from the TSC (if the member can get to the TSC and can have command coverage), or by the crew with the STES team contact via "black phone" (if the member can't get to the TSC) or via voice loops (if the member can get to the TSC but can't command).In a worst case scenario, where the crew cannot communicate with the ground (and vice-versa), the PD believes the crew could perform PCG-STES mals; however, if AOS and the crew has to perform a mal, the PD would like it to be understood by the POIC that one of the STES team members should be contacted and be present via TSC or black phone support during execution of the mal.

** Note: Voss was trained on the Status Check Matrix only. However, PCG-STES believes if Helms were not available, then Voss could execute any of the above procedures, provided that science was in jeapordy and a PCG-STES representative was on the loops.

*** Note: OBT must be completed prior to this procedure being executed.

**** STS-101 Prime Operator

Training Hour Deltas to matrix

EXPRESS Rack training required 5 hrs. Actual training received 3.5 hrs

ARIS training required 2 hrs. Actual training received 1 hr.

HRF Rack/PC/WS training required 5 hrs. Actual training received 3 hrs.

H-REFLEX training required 3.75 hrs. Actual training received 1.25 hrs.